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BRITAIN'S LEADING MAGAZINE FOR THE AMSTRAD CPC 464 ● 664 ● 6128

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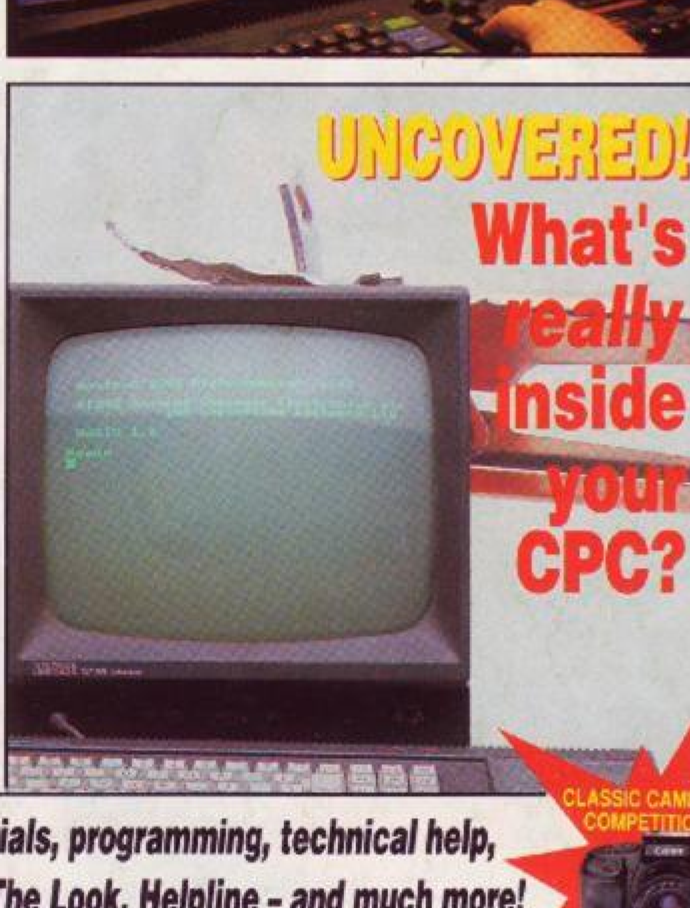
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CLASSIC CAMERA COMPETITION

page 22



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AMSTRAD ACTION ● JULY 1989

FRONT END

NEWS●LETTERS

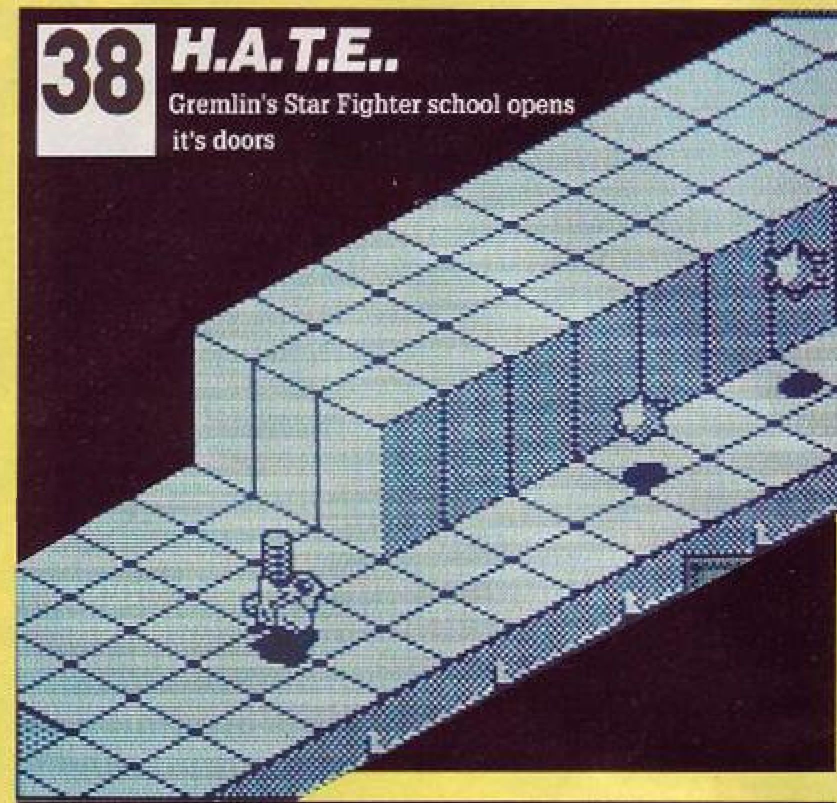
SERIOUS SIDE

SOFTWARE●HARDWARE●PROGRAMMING



THE ACTION BEGINS ON 38!

THE CREAM OF CPC ENTERTAINMENT







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ABC

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July-December 1988



ACTION TEST begins on page 38!



RAVE!



Summer hots up

It's the oldest cliché in the computer world. Come summer, school holidays and long lazy evenings no-one wants to sit inside tapping away at a CPC keyboard.

Oh yeah? Already we're in July, when things are supposed to be slow and the living is easy. But the joint is still jumping! It must be said that there's little happening in the serious software releases department. But then, that's been true for a long time now, and it's unlikely to change. Games, however, are a different matter. We've squeezed in as many of the new releases into an *Action Test* that's as large as we can reasonably make it (we do have to keep both games and serious users happy as much as possible!). Yet we've still had to hold back a number of serious releases that really should be getting the *AA* treatment.



In fact, we're just as busy as we were this time last year. There can be no doubt that the much-vaunted Renaissance of the CPC is more than a blip. We're doing better than ever!

Steve



AMSCENE

releases... updates... previews... new releases... updates... previews... new

Pandora opens up the chance for first time programmers

Swift software have released *Pandora*, a programming language designed to enable people with little experience to write games on the CPC.

Designed around a bank of 48 sprites, each of which can move independently around the screen and wrap or bounce off the edges, *Pandora* includes scrolling commands and a sprite editor.

Demos suggest that the language is capable of producing fast, smooth, attractive games of publishable standard. The manual, written in readable English, may for this reason be unique.

Basic – but fast

Though *Pandora* is a form of Basic it runs much faster than normal, and is an entirely different kettle of fish from your Locomotive Basic.

The way it works is this. Your bid for Game of the Year is loaded into the computer as an ASCII file, and then compiled to form a 'stand alone' machine code program. Even people who don't have a word processor to write ASCII with (are there such beings?) are not forgotten – a simple editor program is included with the package!

Deal on the cards

Robin Nixon, director of Swift and brother of 24 year old Chris who actually wrote the program, pledges a policy of continunous improvement: 'It's constantly evolving, with more features being added all the time,' he told *AA*.

'We're hoping to get lots of suggestions from users of the program,' he went on, 'and one of the first things we add could well be an option to add your own machine code routines, to customize *Pandora* for whatever kind of game you're writing. You don't even need to use sprites if you don't want them!



● Could *Pandora* be *your* first step in a sofware career?

'We hope too that a distribution deal will be signed in the near future. Soon after that it'll be available in the high street.'

There's a bonus too: buy it before July 31st and receive a free calculator or watch.

Open the box and take the money

'We're also on the lookout for games written with *Pandora*,' Nixon went on. 'At the end of August we'll go through them, and stick the best ones on a compilation package at the usual rates of £9.95 and £14.95. And of course, the authors will earn royalty payments if their program is included!'

Pandora costs £29.95 on disk, and £24.95 on tape. Contact: Swift Software, 347 London Rd, Hazel Grove, Stockport SK7 6AA ☎ 061 456 0926.

● Pandora *arrived at this office too late to receive the detailed examination it will clearly require before we can offer our verdict: look out next month for the definitive review!*

Heard it all before

So what? Most games creators take a degree to use, are incredibly slow and produce naff games. Other programs which fulfilled similar functions have already appeared before.

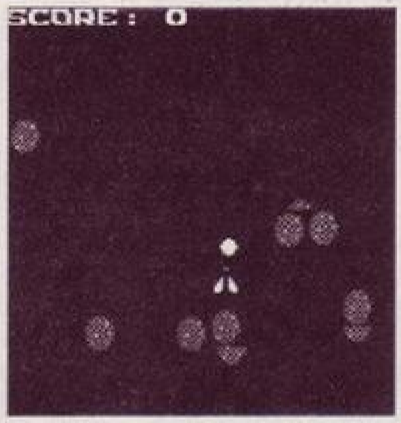
There was, for example, *Laser Genius*, written by much acclaimed Oasis software and sold under the Leisure-IQ label by Ocean; *Panda Sprites*, an early Oliver twins' success, sold (and still available) from Interceptor Micros; and *Shape 'n Sound*, an abortive attempt by Amsoft that apparently never appeared in any quantity. All have sunk into obscurity.

Pandora, however, is rather more than these simple sets of extensions to Locomotive Basic: it's a language in itself. It is faster, and games written with it are more compact (because they are tokenised before being compiled).

There is every possibility that Swift should make quite a splash – and who knows, perhaps we'll see a good few arcade successes written with it? Certainly it's a good way to get started for people whose desire to get games published is not matched with knowledge of machine code.

Swift have had the wit to announce the competitive element along with the release of *Pandora*. So get cracking – and who knows, we could soon be reviewing your game in *Amstrad Action!*





● *Pandora:* left, code, and right, a simple demo game

Budget war hots up as Ocean join the fray

War is breaking out down at the budget end of the software market, with the long-expected arrival of Ocean and major initiatives from Roger Hulley's Alternative outfit.

Ocean have put the cat among the pigeons by announcing a new 'Hit Squad' label. *Rambo, Daley Thompson* and *Enduro Racer* are first to be reissued.

They're aimed at the younger purchasers, with releases timed to coincide with the half term school holidays. Ocean plan to release three budget games a month, each batch comprised of a sports, film and arcade theme – the next batch are *Yie Ar Kung Fu, Miami Vice* and *Green Beret.*

Themes are to be coded to encourage continuous buying at the rate of one game a month to ensure that the set is collected. Futher incentives may be added later, such as special collectors' racks for sets of one game theme.

Even non-Ocean releases could find their way onto the label as the Manchester based giants have set about acquiring other houses' software for compilations. *Barbarian* or *Crazy Cars* could be on the shelves again, this time at the now firmly-established £2.99 budget price.



● The budget market is expanding to incorporate last year's full price games too

A drop in the Ocean

It has been agreed, however, that none of this software from non-Ocean sources will hit the streets in budget format until two years after full price debut. This puts Ocean at a disadvantage, for Kixx (US Gold's budget arm) are releasing games of *Cybernoid* quality just over a year after the initial launch (reviewed *AA*32 May 1988).

This was a Hewson original, and has already been on Gremlin's *Space Ace* compilation. It seems likely that market forces will eventually force a much quicker budget appearance.

This activity comes at a time when other software houses are pushing budget software harder. Alternative and sister label Summit reaffirmed a commitment to the £1.99 and £2.99 market by bidding for games written by Dinamic and Martech.

Annoucing their intention to release *Army Moves* and *Game Over* – ironically released at full-price by Ocean – Alternative boss Roger Hulley is cannily laying claim to be the 'first budget software company to sell former Ocean full price titles at budget price.'

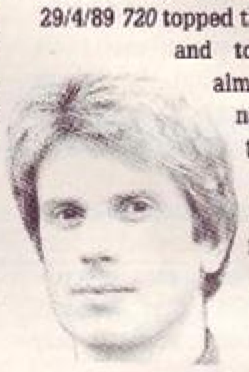
Hulley optimistic

Hulley has such faith in the future of the budget market that *he's just* launched yet another label, this time optimistically entitled Winners. First from the new stable is *War*, a scrolling shoot'em'up, would you believe.

Hulley is keen to point out that, in terms of games sold in the UK open market, Alternative were at number one more often than anyone else.

This dominance of lower price range sales, Hulley claims, is set to continue: 'This year,' he promises, 'we shall continue to dominate the market.'

Kixx are currently enjoying the good life too. For the week ending 29/4/89 *720* topped the budget charts, and total sales were almost double Alternative's. Indeed they were only 2% behind budget software's most prolific producers, Codemasters.


● Alternative's Roger Hulley: confident

The ultimate in joysticks?


● The RR of joysticks?

If you stop to consider it, joysticks are like toothbrushes. Well, they are in one sense, anyway: some poor marketing person has the job of convincing potential customers that this new stick/brush is, despite all the evidence to the contrary, exciting, revolutionary and well worth throwing away your current model for.

Most of the time, of course, this is just nonsense. Just occasionally, however, a joystick is produced that is so bizarrely over-equipped that you just can't ignore it. De Gale Marketing's Quickjoy V Superboard is one such item.

'It's the Rolls Royce among joysticks,' commented a De Gale spokesperson, just to see if any RR lawyers were reading *AA*: 'it has no less than six fire buttons, an autofire with speed control and an impressive ten micro switches giving the games player precision control.'

But that's not all, is it? we prompted. 'No, indeed! The Superboard also comes with a built-in digital stop watch with LCD display!'

Er, why? 'Oh, many reasons.' For example? 'For example, timing the paths of aliens, or to enable a player to measure how fast he' – or she, of course – 'or she, of course, is improving in multi-level games.

'Furthermore, in two player games the stop watch adds an extra level of competition, while other games have a time limit in any case so that the stop watch will be invaluable...

'And of course it can also be used as a form of watch. Whilst playing extremely addictive games it is possible to lose all track of time, and so the Superboard joystick might stop many computer games players from being late.'

Quite. And judging by the publicity pictures issued with the Quickjoy V Superboard, it can probably perform a fairly creditable reverse somersault with two and half forward twists.

Which is more than you can say for a toothbrush.

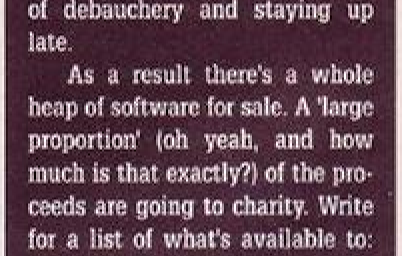
The alleged Rolls Royce of joysticks costs £19.95 from De Gale Marketing who are at this very moment sitting by their phone nervously awaiting your call on ☎ 01 637 5735.

PS to De Gale Marketing: Pat McDonald, who invented the joystick-with-a-watch featured on the cover of *AA*33, is eagerly awaiting the first payments of his royalties.

Software sale starts

Fanzine *The Bug*, which somehow survived half a decade without ever quite being sued, is closing down. Its various rapidly ageing contributors and backers are getting themselves into a right tizzy about exams, and then hope to head off to university and a life of debauchery and staying up late.

As a result there's a whole heap of software for sale. A 'large proportion' (oh yeah, and how much is that exactly?) of the proceeds are going to charity. Write for a list of what's available to: *Well It Is For Charity*, 28 Leeside Avenue, Muswell Hill, London N10 3BU. Enclose an SAE or you'll never hear from them again.



● The *Bug* software sale starts soon – buy now, save £££s!

Multi media launch for *Lone Wolf*

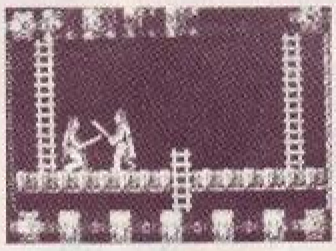
Hot on the heels of Audiogenic's fabbo soccer sim *Emlyn 'Crazy Horse' Hughes* is a *Lone Wolf*. No, *Lone Wolf* isn't a rogue midfielder, but a warrior of ancient times cursed to live out his life in appalling 'fighting fantasy' style books.

Tired of turning to page 73 only to find himself ripped asunder by Orcs, the *Lone Wolf* has escaped and is now poised to assault the senses in a three media launch – a novelisation of his adventures, an interactive 'phoneline *and* a CPC adventure-type arcade game!



On the old dog'n'bone your aim is to guide him through a castle and emerge alive (until, that is, your parents receive the 'phone bill), while the books are a codification of the adventure game novels.

The computer game, however, is a completely new story with old Wolfie chops reflecting (geddit) upon the *Mirror of Death*. It's a *Barbarianesque* mix of magic and hacking in which Our Hero searches a wizard's tower for Lore Stones.



He can choose special 'Kai' abilities to aid him in this quest, including the power to call a wolf to give him a helping paw in sticky situations.

Previous outings by Joe Dever – didn't he do Annie's Song? – have proved inexplicably popular, and it remains to be seen whether his medieval man'o'war can cut it on the CPC.

At least we'll be spared Dever's excruciating mish-mash of 'Gothick' and Olde Worlde prose, the principal devices of which appear to be inventing names with four vowels and no consonants, and into a strange word order his sentences putting.

Are we in for a treat? You



Pat delivers

The man in the hat is back, and this time he's brought his cat! Yes, the world's most annoyingly nice person is all set to make his screen debut.

Star of T.V. and stage *Postman Pat* is finally ready for the CPC. We are eagerly awaiting *(speak for yourself – ed!)* the delivery of this, the ultimate challenge – actually getting it in one piece through in the mail that is!



How do you make a Maltese cross?

Even Messrs. Cruise and Newman would be hard pushed to see the colour of money – or 'color' as they insist on calling it – if they were to play *3-D Pool*, latest release from Firebird.

You get to play in a tournament against the world's greatest – Fast Freddy, Mighty Mike and even 'Maltese' Joe, real life European Pool Champ.

The action takes place in some seedy dive (geddit) over a realistic pool table, around which you can move up, down, in, out and any which way you choose.

Once you've picked up the hang of playing without a cue – honest! – you can control the pace, spin and swerve of the cue ball. Fortunately there's also a practice and tutorial facility to allow you to learn some trick shots of your own. *3-D Pool* gets the full *AA* treatment next month.

And the way to make a Maltese cross, of course, is to beat him at pool.



Red LED team is signed by Mirrorsoft

If the Taglione/James team have anything to do with it, adventures will never be the same again. The team who brought us *Red LED* (*AA*27, 92%) have been signed to Mirrorsoft and are currently having sleepless nights over their new project for the CPC *Bloodwych*.

An adventure with a difference, *Bloowych* features a split screen allowing two players to play, either together or against each other.

The plot, which hardly sounds revolutionary, involves a search for four parts of a jewel (yawn). This jewel when assembled allows the player to destroy evil forever, or if you've had a hard day at the office, banish good from the face of the earth.

Of course you've got to beat the other guy to the gems first!





That price rise

AA has gone up in price by 20p. The increase, the first for two years, is due to escalating production costs.

A more detailed explanation is contained in a response to a letter in this month's *Reaction* (see page 11).

Eagle-eyed readers will notice, however that the cost of a subscription has not yet been amended, though it won't be long before the *AA* accountant gets his finger out and puts his foot down with a firm hand. Turn to page 26 and take advantage of this unusual oversight (the only other time the *AA* accountant is so slow off the mark is when it comes to paying out wages).



REACTION

Letters of protest, letters of praise, letters that leave Steve with his head in a daze...

Dear readers,

Once again the ed rips open your latest missives on matters CPC.

Remember too there's a £15 SOFTWARE VOUCHER for one lucky winner every month! So get scribbling – or printing – to: *Reaction*, *AA*, 4 Queen St, Bath BA1 1EJ.

But no SAEs, please: we really and truly are too busy to reply personally to correspondence.

Steve
AA

PS Address all mail order and subscription enquiries to: *Special Offers, Amstrad Action*, The Old Barn, Somerton, Somerset TA11 7PY.

We can only pass on your letters, changes of address and so on, to them.

●That price rise

So you're going to raise the price of AA by 20p, making it £1.45. I would like to know what we are going to receive for our money – colour photographs, more pages...?

After almost four years of magazines – and I've seen all of them – yours drops from excellent to fair. Why? Well, for some reason the price is getting bigger and the magazine is getting thinner, page by page.

75 pages with 22 pages of adverts – yes I know it's nice to see ads so we can buy stuff, but maybe if you increased the pages to read by 22 we'll get a magazine, not a booklet!

You may think I'm pretty old for the next thing I'm going to say (write?), but why don't you get Ollie Alderton to draw like the old *Amtix?* They were pretty brill drawings – or can he only draw from stuff like *Roy of the Rovers?* Now that's what I call childish!

OK it's a pretty good picture, but 22 year olds and older don't like to be walking around with a comic... 'Comic!' you scream? Yes, pictures and the thinness of your magazine make it look like a comic. So we roll it up embarrassed that someone might think it is a comic. Then when it's rolled up, stuffed down our jackets or whatever, people who see us think we just bought a sex mag – even more embarrassing! We should however be *wearing* our mag with pride and thrusting it into someone's face and smiling at the same time.

Please print this – not so that you'll lose readers, but so that you don't end up like *Computing with the Amstrad, Amstrad Computer User* and finally *Amtix!* You need to be at the top, and unfortunately in my eyes, and probably other people's too, you're not!

Carl Harrison,
Hengoed, Mid Glamorgan

AA: Well Carl, what can I say? Yes, we have put the price up – for the first time in two years, during which time inflation and escalating production costs have taken their toll. We don't like having a more expensive AA any more than you do, but if it's any consolation I can assure you that we're not getting a pay rise on the strength of it! Inflation alone over the past couple of years must total something like 15%, so an increase of just 20p doesn't seem too injust to me. And remember that AA was £1 way back when it started almost four years ago, when you could fill a car with petrol, buy 20 cigarettes, a newspaper and a smallholding in Wales and still have change of a half-crown.

AA this month is 82 pages big, which is the same size as we were over a year ago (March '87) and indeed is 16 pages bigger than last September. Still, it must be admitted that summer issues do traditionally shrink a little. The reason is that most games are timed for release in winter, and particularly at Christmas. Therefore there are fewer games out, and fewer pages of games advertising.

Incidentally, I should make it clear that advertising in magazines – not just AA, and not even just computer mags but all magazines – keep prices down to a great extent. Without them, this mag would cost £4.95!

As for Amstrad Action resembling a comic, I can only say, So what? You must enjoy reading it or you'd be daft to buy it, and if you do, why should you give a monkey's what anyone else thinks? I doubt that anyone is going to laugh at you for reading it, though they may be amused that you are ashamed to be discovered doing so.

Finally, thanks for the warning. But AA remains the only CPC mag in Britain that's independent and hasn't merged with any other one. And that's the way it's going to stay!



●An offer of help

I like the feature in *Action Test* where a second opinion is given on every game. In recent issues I have noticed that children have been helping with these.

I am 12 years old, a 464 owner and a bit of a games addict. Although I live in London, I would love to help with the second opinions of games and would be very pleased if you could send me some to give second opinions on.

John Gordon
Blackheath, London

AA: Unfortunately it's just not possible, John. Resident occasional second opinion authors David Patient and Gavin Hawkins have been coming into the office once in a while to look at new games, and that's the only circumstances in which we could allow anyone not on the magazine to look at unreleased games. Still, if you disagree with what we say about a game you've played you're more than welcome to let us know why.

●Lawsonomics

I read Trenton Webb's review of *Yes Chancellor* (*AA43*) with interest and enjoyment.

The main points are that he seems to have enjoyed playing it and it made him think about the problems of running a national economy. That is all a simple macro economic model can do. Maybe it is all any model can do.

After all Nigel Lawson has access to one of the most sophisticated economic models around (the

Treasury model). He's having his problems, but is is he enjoying them?

Tom Tuite (author of *Yes Chancellor*)
Guildford, Surrey

AA: Quite. The great thing about Yes Chancellor, *of course, is that you can inflict your pet theories on the country without putting three million people out of work and then finding the theories are nonsense anyway.*



● Mr Lawson, hating every minute

●*Aaarrgh-Type*

I thought I'd write to *Amstrad Action* to see if any of your readers had experienced similar problems as I have with the disk version of *R-Type*.

Firstly, not a problem really, just a gripe: the instruction book makes no mention of the Amstrad in its loading instructions or the keyboard/joystick controls.

Secondly, when I plug the joystick in and load the disk, the game crashes. Without the joystick the game loads OK.

Thirdly, once the game is loaded and I plug the joystick back in, the fire button doesn't work. I know the joystick is OK because it works with all my other games.

So is there any way of using a joystick with this game or have I been sold a duff program?

P Crompton
Manchester

PS My computer is a 6128, the joystick is a Cheetah +125.

AA: We didn't have any trouble playing R-Type *(though we have to say we weren't crazy about the game), and reckon it's more likely to be a problem with your joystick. (We agree that this business of producing cross-format manuals and then ignoring the CPC is a bit of an insult. Bad form if you ask me.)*

Does it work with other games OK? If you have the autofire button switched on it can have odd effects. Try switching it to the other position.

If that doesn't work you could try taking in your joystick and your copy of R-Type *to a computer shop. Go when they're likely to be quiet – a weekday afternoon, for example, rather than a Saturday morning!*

Tell 'em AA sent you and we'll mention their name if they help you out!

●C/PC/W

We have a PCW as well as a 6128, and when the 'games' machine is in use it isn't possible to type in listings from other sources.

As both machines use the same disks I enter the CPC listings in a document created on the PCW. When complete, change it to ASCII file (simple text file) and save it on the disk used for basic programmes in the CPC. From there they can be error checked etc.

This may seem a bit long winded to some, but there is a distinct advantage: it's far easier to edit the listing on the PCW as you can move up and down the lines just using the cursor keys rather than the edit



● The CPC and the PCW: an unexpected but useful combination

function on the CPC.

Basic programs saved in ASCII format on the CPC can be 'inserted' into a document on the PCW and worked in the same way.

Colin Farmer
Scunthorpe, South Humberside

AA: Though we don't suppose there are many people out there in the same position, Colin, we'll pass on your tip anyway.

Thinking about it, a CPC and a PCW make a very good and very cheap combination – a kind of elementary network.

You might be interested in Steve Patient's article on PCW CPM software – which of course can be used on the CPC. It's on page 52 of this issue.

There I was, sitting down typing out an extremely large program, minding my own business, when all of a sudden a spark flew out of my user port, reset the machine, and in the process sent a very large shock into my wrist. Now, I heard somewhere that this affects the sound chip in that it blows it out.

Anyway, in short, is there nowt I can do to stop it doing so, or is my CPC going to self-destruct?

Michael Heyes
Nelson, Lancs

What you've experienced, Michael, is the dreaded static elecricity syndrome – certainly a bigger threat to CPC safety than the viruses people keep talking about.

Once it's happened there is absolutely nothing you can do, and it is indeed not unknown for such an event to blow your sound chip – and worse.

Precautions you can take: static builds very well if your CPC is on a desk where there is a carpet on the floor, so if that can be avoided do so. You must always earth yourself by touching something like a metal desk leg or chairleg before you plug or unplug anything to or from your CPC. And never, but never plug or unplug anything – such as a joystick or whatever – when your computer is on.

And above all, don't touch the legs on a ROM chip or any other kind without earthing yourself first.

●What, *more* football?

As a follow-up to last month's football feature, here is a special report. The scene: an important semi-final clash: Spurs v Nottingham Forest.

It was the *Matchday*. *Brian Clough's Football Fortunes* seemed to be changing. The *Victory Road* looked clear as it seemed to be *History in the Making*. *Out Run* the teams. Straight away an attacker put on a *Super Sprint* but is caught by a *Savage* tackle. It is a sending off, giving his team a serious *Andy Capp*. It looks to be an *Impossible Mission*. Suddenly there is a *Total Eclipse* and the game has to be called off!

It is a *Great Escape* for Forest!

Kevin 'AA' Conchar
Dumfries

AA: Er... extornery, as D. Coleman might say, absolutely er, extornery.

Any other similarly daft contributions? A tenner for the best (or should that be the worst?).

●Help required

Recently I purchased *Elite*, on the *Supreme Challenge* compilation. In my opinion, it is an excellent game

●Giving the people what they want!

I only buy *AA* to read the games reviews and *Cheat Mode*. You should include a software chart every month – I bet lots of other readers would be interested too.

I can hear what you're saying: 'There's no space!' Well, in that case take out *Forum*, *The Look*, *Day in the Life*, *Pilgrim* and *Afterthought*. Then you can put more in *Action Test* (there's an average of ten games reviews per month. Not a lot, is it?) and more *Cheat Mode*.

I also think readers would be interested in a new section entitled *Arcade Action*, where they could find out about new and current arcade games and look forward to their conversion for the CPC.

A.A. Trieu (14 and three quarters – note the initials!)
Holloway, London

AA: Dear AA, thanks for the suggestions. We're seriously considering a games chart, but we need to be certain it's what you, the readers, want. So if it is, get writing and we'll do the rest!

Apart from that, however, I'm not convinced. Forum in particular seems to be a very popular part of AA, and the others too have their place.

And I don't think an arcade section would be entirely appropriate to AA. After all, if we're honest what makes a good arcade conversion is gameplay, not the fact that it's come from an arcade. It would take a real CPC nut to claim in all seriousness that the Amstrad can really reproduce the performance of an arcade machine!

with ultimate realism and gameplay, but alas, after achieving a rating of DANGEROUS, I hyperspaced to a planet called Solaega, (which can be found on the second galactic map). When I arrived I had a fuel leak message. No problem, I thought: 'I'll just hyperjump to the space station and purchase some fuel.' During the hyperjump, the display panel of my cobra MKIII spacecraft changed colour and I received another message which read, 'Coriolis space station in danger'. Whatever could this mean?



● Elite – one of the classics

Well, once I was within the space station's protective range, I switch the docking computers on, and in no time at all I was docked. I pressed the appropriate key in order to purchase some fuel. To my utter dismay this particular station didn't sell fuel. 'That's OK' I said, 'my craft has fuel scoops so I can 'skim the sun' and gain free fuel.' I pressed 1 on the keyboard, which allows me to leave the space station. Upon pressing it, I received a message which said,' The sun is going to nova will you save us? (Y/N)' I pressed Y and when I leapt the station my cabin temperature rose dramatically – and I blew up!

So there's my problem: no fuel. Does anyone have any suggestions as to what I can do?

Mark Gibson
West Bromwich, West Midlands

AA: Well, we had a large number of Elite tips in AA7, and more in issue 8. Then in AA20 we printed an excellent 'Complete Poke,' which indeed did include infinite fuel. That's the good news.

Unfortunately, however, every issue up to and including AA22 is sold out. That's the bad news. I'm afraid all that can be done is for you to try to get your hands on a copy – Helpline usually seems to do the trick.

●NCL: a warning

There used to be a software library called MCL (Midland Computer Library) based in Worcester whose customer service was not very good. They moved to Redditch (or were bought) and became NCL (National Computing Library) but I had become dissatisfied with them and started, cautiously, ordering titles through K&M who advertise in your mag. They offered a very good service but due to new laws have now stopped their library service.

NCL also stopped and did a mailshot on all previous customers offering titles for sale at reduced rates. I reluctantly sent off a cheque for eight pounds for a couple of pieces of software.

After waiting for about a month I phoned (twice) and was told (the last time) that my cheque was in the post because the software was no longer available. That was a month ago and I have just written to them to remind them. Naturally I will not let the matter rest.

They also do repairs on computers but needless to say I would not recommend them. I bet some of your other readers have experienced similar treatment and I strongly urge them to contact you if they have because your mag is an ideal place to warn others.

Bob Sanders
Dudley

Well, Bob, it seems you're not the only person who appears to have suffered at the hands of NCL. We had a similar letter from Graham Talbott of Birmingham, and no doubt there are others too.

It seems that there's little that can be done under the Trades Descriptions Act. But a contract has been entered into by NCL offering a full refund, and perhaps that might be the angle to pursue (can you pursue an angle?).

We rang NCL without success. The line is constantly engaged, and the telephone exchange tell us that it's faulty. If someone from NCL, or anyone who knows more about this whole thing, could get in touch and enlighten us we'd be very grateful. There may be an entirely innocent explanation – a failure of communication, temporary cashflow difficulties, who knows?

If you've been sent a useless credit note, get in touch both with us here at AA and with the Trading Standards Office for the Redditch area, where NCL are based. They're on 0905 763763: ask to speak to a Miss Bryden, and tell her AA sent you!

●A Rave about ratings

The ratings you give games are really getting to me. You have four factors: Graphics, Sonics, Grab Factor and Staying Power. I presume that the final rating should be the average of these four factors and that in compilations the rating would be the average ratings of the individual games. But this is not so!

If this were the case *Arcade Muscle* should have been rated 60%, not 37%; *In Crowd* should have been 72%, not 88%; and *SDI* should have got 73%, not 82%! I could go on, because they are *all* rated incorrectly if you go by the law of averages. If you use some other method, please tell me.

Paul Johnston
Dumbreck, Glasgow

AA: The fact that none of our final ratings come out as the average of the four factors, Paul, should have given you something of a clue.

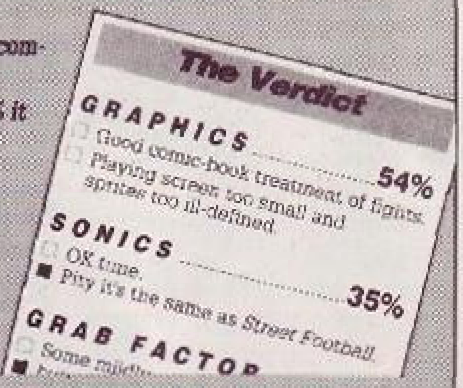
No, we don't use averages, and if you think about it you'll see why. Imagine a game that has great Graphics, Grab Factor and Staying Power and gets 90% for each. But it doesn't have any sound, and gets 0% for Sonics: should it really get an average of erm, add them up, divide by er, that's – 72%?

Or take another example, a game that's well worth full price, scoring between 60% and 85% on different factors. But it's a budget game, and only costs £2.99. We'd be inclined to bump up the final score somewhat, to reflect the fact that at its price it's excellent value.

That's what we did with the compilations you refer to.* Arcade Muscle *costs £13 on tape, and has five games, none of which were Raves or Mastergames; while* The In Crowd *costs £15 and has eight games, of which three were Raves and one was a Mastergame. So we exaggerated the difference to show what we thought.

According to your logic, if one compilation, costing £18 , features two average games that each score 67% it should get a final rating of 67%; while another, that costs £10 and has 12 games, eight of which are absolutely brilliant and score 95% and four of which are real dogs and score 10%, should get a total of 66%. Now is that fair?

It's a mistake to think that reviewing is a science: it's an art. And Trenton is a real artist.



● Games ratings is hardly an exact science, and we prefer justice to strict accuracy

●The great rip-off?

Me and my friends think that, apart from a few games it is simply not worth buying computer games because maybe in a year's time (or sometimes even less) the game is out on a compilation or a budget label. Microprose and Hewson are two honorable exceptions to this complaint.

For instance, US Gold's *Arcade Muscle* features five games from last year. And I groan when I see re-released software on tape at £1.99 when I spent £14.95 for it on disk. Why can't the Codemasters, Alternatives, Encoresand Kixxs of this world produce disks at a 'budget' price of £5.99 or £4.99?

James Howells (12)
Rhydfelin, Mid-Glamorgan

AA: It's annoying, I agree. But if the price is so important to you, why do you buy new full price games, rather than compilations and re-releases? Answer: because they're new. And that, of course, is why they're so expensive.

A similar thing happens to both books and records. You can't buy a paperback at the same time as the hardback comes out; and the biggest selling albums nowadays are those dreadful compilations of Stock Aitken and Dennis Waterman hits.

●Number's up

Why do you print only 'phone numbers in your *Buyers Guide*? Not everyone has a 'phone, you know!

Carl Wilson
Kenilworth

AA: Fair point, Carl, but the Buyers Guide is tight on space as it is. If we put it up to four pages people like James Howells, whose letter is printed above, would complain. Like the man nearly said, you can please some of the people all the time and all the people some of the time, but you can't please all the people all the time.

● *Sugarman* is on holiday

Broadley speaking



Sticking her neck right out, EMMA BROADLEY asks the questions most people don't even dare to think!

Why oh why oh why can't the software industry (with one or two notable exceptions) take a pride in its work? Many games produced are not what they could be: they simply don't use the CPC's capabilities to the full.

Take graphics. In either mode 0 or mode 1 the CPC has the capabilities to handle colourful, detailed and well animated sprites, as shown by such games as *Barbarian* (loved the gameplay, darlings, hated the advert). In general, it takes no more memory or a loss of speed to print such sprites, yet so many companies do not feel that it is worth spending some time over the graphics of a game. Instead they continue to churn out the same old monochromatic rubbish.



Sounds boring

The CPC has excellent musical capabilities, as anyone who has heard such masterpieces as Rob Baxter's transcriptions will know. Yet software houses are only beginning to include tunes with their games. But still the sound effects with most games are rubbish. I must add that they are difficult to get right, but so little time is spent on them. Some games don't have any, which is a complete disgrace in my book.



I'm not saying that good sound and graphics make a great game. They don't. Some good games don't have such effects. But these games would be considerably enhanced with their addition. The buyer would be more impressed, and feel he has had better value for money. Raff Cecco is one example of a programmer who cares. You only have to look at *Cybernoid II* to see that, and from the previews we've seen of *Stormlord* – *(reviewed in this month's* Action Test – *ed.)* Mr Cecco appears to be going from strength to strength. And look at the reception his games have received, and the interest over what he is going to come up with next. It is not only his excellent gameplay, graphics and music which make his games, but also all the little added touches such those on the title screen and demo on *Equinox*, a game you may remember from days gone by.

"So when will software companies wake up to the fact that they have such a brilliant machine at their disposal?"

If it don't fit, force it!

But how can all this be squeezed into 42K, I hear you ask? It can't. More and more tape games are resorting to tedious multi-loads to increase the memory available. The disk versions are, in general, exactly the same as the tape. But what about 128K disk only games? Multi-load? – No problem with plenty of memory. Just think what could be done. This should be acceptable because according to the last *AA* reader survey two-thirds of Amstrad owners have disk drives, and almost 60% have 128 (or more) K. Cut down tape versions would still be available for those without.

But alas, disk versions are exact copies of the tape version. They shouldn't be. Even the Spectrum has 128K versions of many games. Take the classic game *Elite*. The disk version is almost exactly the same as the tape. So we poor Amstrad owners are left with a game which is infinitely inferior to the BBC disk version. Yes, the BBC! The computer with less than 32K of RAM available, and only a 100K disk drive. Acornsoft, by using the BBC's facilities to the full produced a game in 1984 with fast, smooth, 3D animation and fantastic gameplay, at a time when we were still being treated with such drivel as *Roland on the Ropes. (I liked* Roland on the Ropes - *ed!)*



Think what Telecomsoft could have done with a faster processor, more memory and a bigger disk drive. More ships, more missions, faster animation etc...

Three inch wonder?

Even Incentive's brilliant Freescape games could be improved by using 128K and a disk drive. Decent sound effects and larger playing areas, and perhaps (if possible) faster graphics.

So when will software companies wake up to the fact that they have such a brilliant machine at their disposal? I'm sure more disk drive owners would buy disk games, instead of Multifacing from tape, if they knew they would get a considerably souped up version. So come on software companies, get to work!

Talkback

Last months column reopened the whole 'Sex and Violence' debate and some of the letters I've recieved upon the subject were keen to point out other sides of the argument. *No nonsense* Scot, Adrian Forbes felt my condemnation of exploitative pictures of women being used in games promotion missed the point.

'I'm sure that people don't buy games for the *brilliant* poster of *marvelous* Maria. Why would someone spend TEN pounds on a game for a picture of a scantily clad woman when they can buy a pornographic magazine for £1.50 and see her totally nude!'

Surely the point must be that games packaging ought to reflect the game and not some totally unconnected (and often misleading) illustration. Unfortunately I feel that people do buy the games partially because of the image surrounding it. Leggy 'off the peg' blondes have been used effectively for the sale of eveything from Cadburys flake to luxury cars, and more often than not you don't even get a poster!

As to the point concerning pornographic magazines, it is slightly less embarassing to walk out of 'Smiths with a copy of *Vixen* in your hand than literature from the top shelf of the sport and hobbies rack. I do take your point though Adrian that people don't automatically buy a game just for a titilating cover. Although I must admit that even *Sabian Island* may have merited a second look if it had featured Harrison Ford in boxer shorts on the cover!

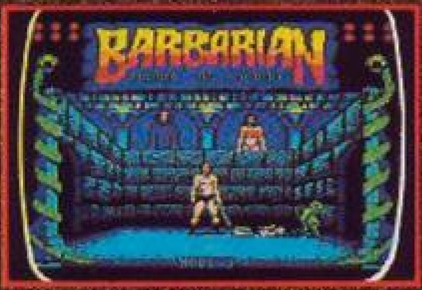


The CRUCIAL COMPILATION





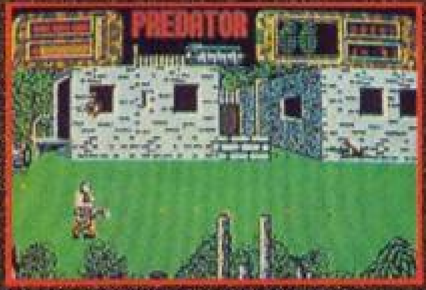
GRYZOR Featuring all the game-play of the arcade original. Gryzor takes you into a thrilling alien world of force fields, fanatical guerillas and strange enemy defence systems – but you have the fire-power and maybe, with a "little" skill, grit and split second timing, you can infiltrate the aliens' headquarters. Play Gryzor once and you'll be hooked!
© 1987 Konami



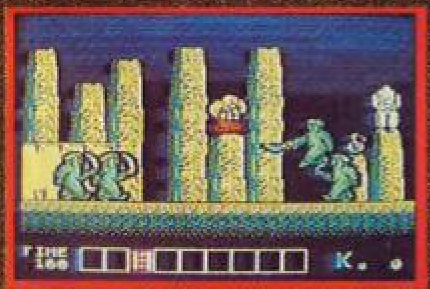
BARBARIAN THE STORY SO FAR... The evil sorcerer Drax has agreed that if a champion can be found who is able to defeat his demonic guardians, the Princess Mariana will be released. From the wastelands comes an unknown barbarian, a mighty warrior, wielding his broadsword with deadly skill. Can he vanquish the forces of Darkness? ONLY YOU CAN SAY...
© Palace Software Ltd



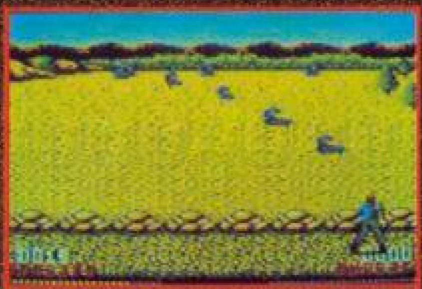
CRAZY CARS You are racing in the world's craziest race: "The American Cross Country Prestige Cars Race". If you are able to complete the race before the time runs out, you will get a faster car. You start with a Mercedes 560 SEC, and only the world's best drivers may drive a Ferrari GTO.
PREPARE TO START, READY? GO!!!
© Titus Software Ltd.
LAST NINJA replaces C.CARS on C64.



PREDATOR You've heard about Predator, the Schwarzenegger movie – now you can play the leading role. Take a crack commando unit into the South American jungle to rescue a bunch of trapped diplomats. Should be easy enough...and so it would be, if it weren't for the mysterious alien who keeps on taking out your men.
© 1987 Twentieth Century Fox Film Corp. All rights reserved.



KARNOV Join Karnov, the fire-breathing Russian stongman, on his hazardous quest to defeat the evil dragon Ryu and find the Lost Treasure of Babylon. Karnov is a vast 4-way scrolling game that combines both strategy and fast action in nine challenging levels of gameplay. It is recognised by arcade addicts everywhere as one of the best games of its kind. Karnov also has something special in the way of characters – have you ever been killed by a skeleton on an Ostrich?
© Electric Dreams Software Ltd.



COMBAT SCHOOL Konami's arcade hit now for your home micro and already a No. 1 hit. Seven gruelling events featuring the Assault Course, Firing Range, Arm Wrestling and Combat with the instructor himself! Combat school throws down the challenge to the toughest of thoroughbred gamesters.
© 1987 Konami



TARGET RENEGADE Every move you make, every step you take, they're watching you. Fight your way through the precinct – the back alleys, the car parks, fight your way through the villainous community, the skin-heads, the Beastie Boys, the bouncers. This is just the tip of the iceberg on you chilling quest to confront "MR. BIG".



PLATOON Lead your Platoon deep into enemy territory, you can almost feel the humidity, sense the threatening dangers as you encounter the enemy and his many booby traps. Having found the underground maze of tunnels, enter at your peril! Enemy soldiers lunge at you from the murky waters within, but this is the only way you can find vital information. If you come out of this alive, you'll be just one of the few!
© 1986 Hemdale Film Corporation. All Rights Reserved.

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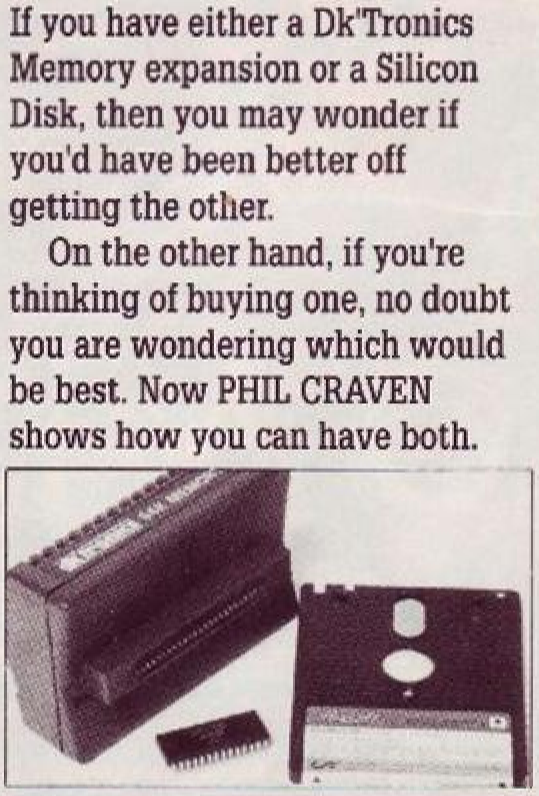
Ocean Software Limited · 6 Central Street · Manchester · M2 5NS · Telephone 061 832 6633 · Telex 669977 OCEANS G

How to have your cake and eat it



If you have either a Dk'Tronics Memory expansion or a Silicon Disk, then you may wonder if you'd have been better off getting the other.

On the other hand, if you're thinking of buying one, no doubt you are wondering which would be best. Now PHIL CRAVEN shows how you can have both.



● Dk'tronics Memory Expansion Pack...

Dk'tronics Memory Expansion – or Silicon Disk? For the great majority of us it comes down to a straight choice, and having both items is way beyond most pockets.

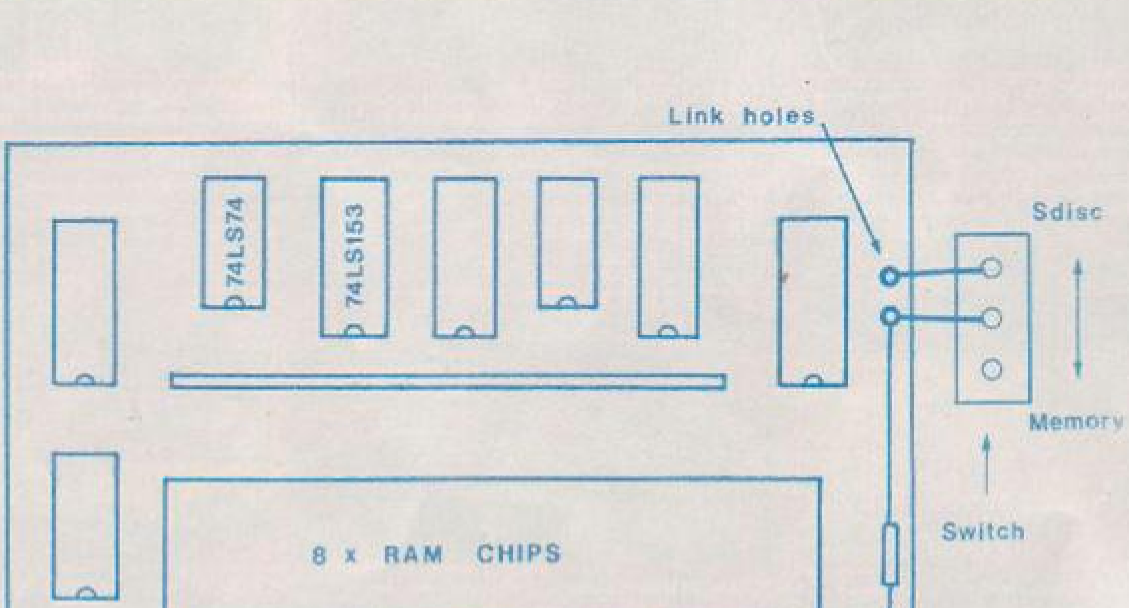
The trouble is that a year or so ago the price of memory chips shot up so much that a dynamic RAM chip which used to cost £3.50 now costs about £9. As a result these expansion units rose in price, so that a 256K Memory pack now costs £129.95, and a 256K Silicon DisK costs £149.95.

But now *AA* comes to the rescue! For the modification described in this article allows either unit to be switched between Silicon Disk and Memory operation as needed. So a Memory can be used as a Silicon Disk, and a Silicon Disk as a Memory. (The modification for the 464/664 pack is different to the 6128 version. But fret not: both are described.)

Two for the price of one

There are two differences between the products. Firstly, the memory for each is supplied in its own CPC styled box, but the SdisK comes with a second, identical box which contains the necessary ROM software to run it – hence the extra £20. Ram Electronics supply the second box with the ROM for £20, or just the ROM chip to plug into a romboard for £15. So far, so good. The second difference concerns the circuit boards inside the memory boxes. The Sdisk's memory board and the Memory's board are identical except for one thing. They have links which must either be made or cut depending on which function it is to perform. What we are going to do is fit a switch to the box, whether Memory or Sdisk, so that we can select the function we need when we need it and, provided that we have the Sdisk ROM installed in a romboard or in its own box, we can have both products in one unit. ●

464/664 owners: this is your box!



● Diagram 1: the board layout for the 464/664 version

DIAGRAM 1 shows the layout of the chip side of the board and the position of the two link holes along with the switch connections. The track between the holes needs to be cut – if it isn't already – and a pair of wires need to be soldered, one to each hole, and connected to a switch as shown. In the up position the link is made and the board operates as an Sdisk. In the down position the link is broken and the Memory function is selected. That's all there is to it!Maplins (☎ 0702 554155) stock a suitable switch for 80p – part number FH00A – which mounts onto the side of the box in a hole which you have to drill. Function selection can then be made from the outside Most boards have eight memory chips as shown, but there are a few with only two. The link is not present on this type and the modification cannot be done in the same way. The two chips marked with their numbers may not be present on a 64K unit and only need to be fitted for an upgrade to 256K.



6128? This one's for you!

DIAGRAM 2 shows the chip side layout.

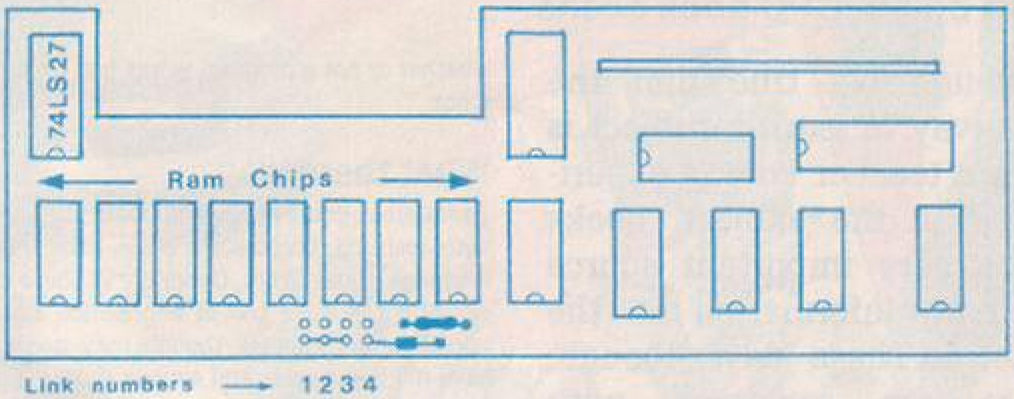
The first thing to notice, though, is the 74LS27 chip in the top left corner. Most boards have it installed; some don't, and you need it for Sdisk operation. Maplins (☎ 0702 554155) supply it for 25p – part number YF18U.

Be sure to fit the notched end of the chip as shown in the diagram. Four pairs of link holes are shown at the bottom of the board numbered 1, 2, 3 and 4. For Memory operation we need links 1 and 4 to be made with link 3 cut (diag. 2a), and for Sdisc link 3 needs to be made with links 1 and 4 out (diag. 2b). Link 2 doesn't come into it at all.

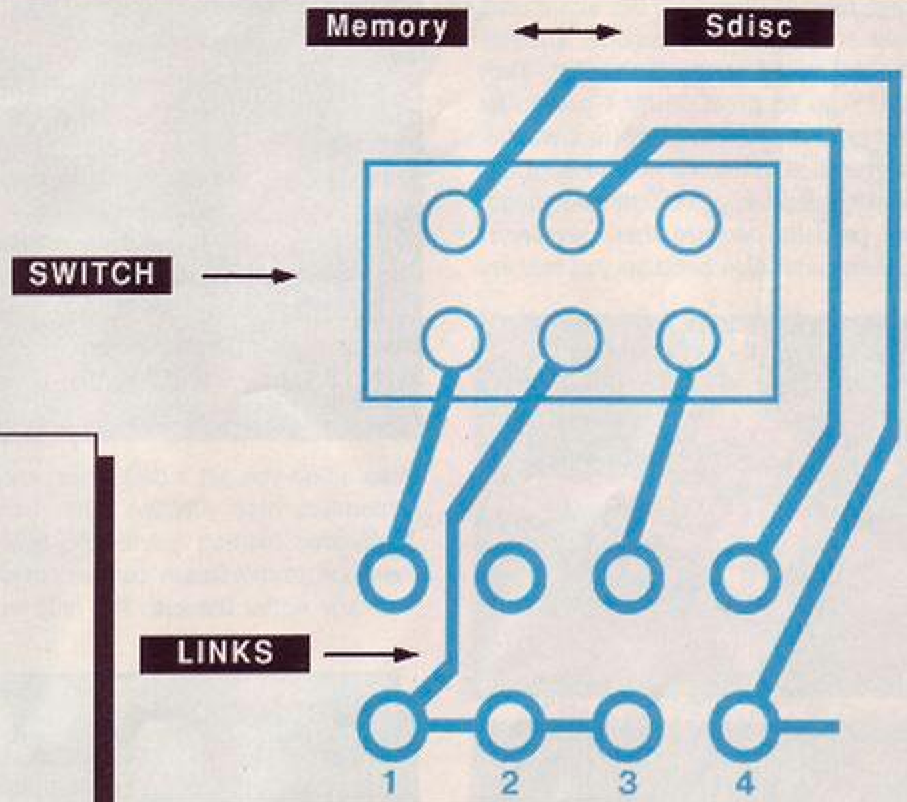
First cut links 1, 3 and 4. The bottom holes of 1, 2 and 3 are connected together so we can fit a switch which toggles these bottom holes between the tops of links 1 and 3 and, at the same time, make and break link 4.

A double pole double throw (DPDT) type does the job when connected as shown in diagram 3. Maplins switch, part number FH04E at £1.20 mounts on the box as described for the 464/664 version.

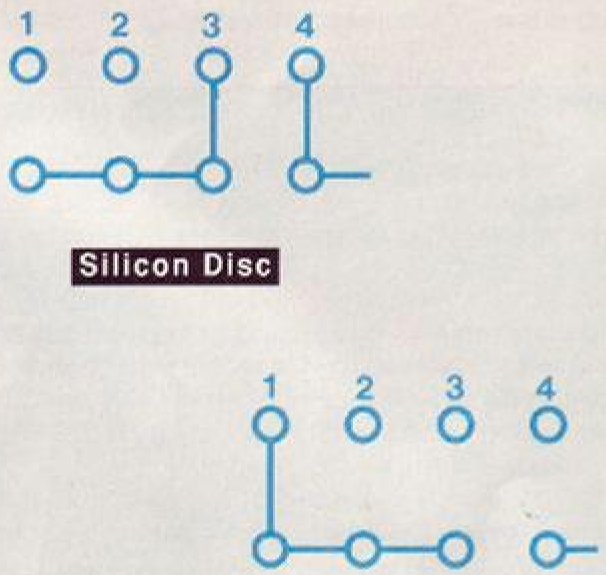




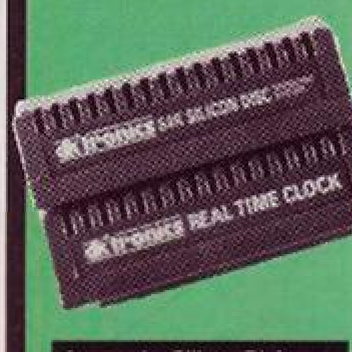
● Diagram 2: board layout for the 6128



● Diagram 3: switch connectors for the 6128 version



● Diagrams 2a and 2b: link configurations for the 6128



● ... *or* the Silicon Disk – now you can have both!

Thanks for the memory

These modifications work on both 64k and 256k versions.The Sdisk ROM doe not need to be removed when the Memory function is selected.

Just out of interest, 512k of memory can be obtained by connecting two 256K units to the computer. One should be configured as a Memory, and the other as a Silicon disk.

In Print



Need a muse to help you out? PAT MCDONALD holds forth on the CPC book scene

Although it's true that the best way to learn a subject is from a teacher who is experienced in the subject, books are a very important source for hard information on the Amstrad.These days though, there are problems with obtaining said info.

It's all very well us printing a book roundup and saying 'such and such a book covers that subject'. What if want some help of a similar but slightly different nature? Perhaps the subject isn't covered at all.

The first, most fundamental fact about computer books is that the vast majority are self-learn tutorials, aimed at the enthusiast. They don't usually go to great lengths to explain subjects, or predict possible areas for mistakes. Have you ever tried to learn a foreign language from a book? Admittedly computer languages are easier, partially because there are fewer words to learn: and also because you can see whether or not a program works just by trying it out.

What there is

There are a great number of books concerned with learning Locomotive Basic, the in-built language of the CPC's. Generally all these consist of is the same sort of information as contained in the manual, though they generally have more examples and explain things slightly better. Some books are genuinenly useful for learning to program in Basic at the semi-serious level, ie writing databases or adventure games.

Other Amstrad high-level languages have only a couple of books between them. Hisoft C and DR Logo (supplied free on the system disks when you get a disk drive) are the lucky contenders here. On the other hand, if you don't mind reading a non-CPC specific book, there are an inordinate number covering every language under the sun. The only snag is that the Amstrad implementations are often slightly different to the 'standard' versions.

There are also a fair number of works to teach CPC machine code. They're generally quite good at explaining how the central processor works, and also how to write simple subroutines. Generally though, they cannot go to the same level that the Basic language books go up to: the reason is that worthwhile assembly language listings are always laboriously long to read.

Imagine say, a 10K long program. In Basic this would comfortably fit in three pages of *Type-Ins*. The same sized program in assembly language might stretch to 40 or 50 pages of this magazine. One machine code program can be up to 42K long...

Other subjects covered are graphics (mainly just the inbuilt commands, not much about sprites, backgrounds or 3D), music and sound, adventure games, disks and CPM – quite a few on this one. *The Amazing Amstrad Omnibus* is well worth a look, because it's got a little bit of everything.

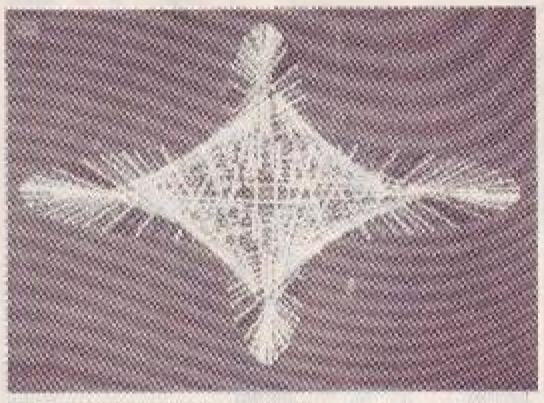
Sadly lacking

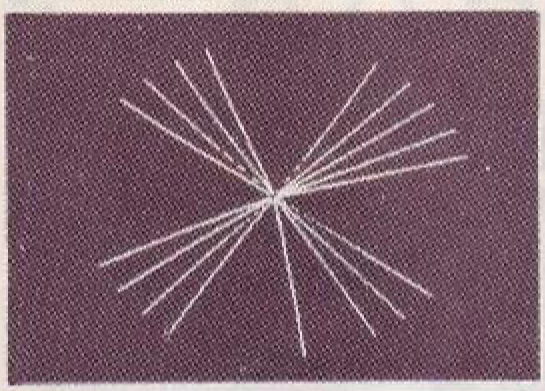
A brief note on what there isn't. There's precious little CPC material on advanced machine code, desk top publishing, communications, writing educational software (a sadly underestimated field) or game design. I'm sure that any books on these would prove popular, but there just isn't anything. Possibly because the software industry wants to guard its secrets?

Oops, missed some

We don't claim to be infallible, here at *AA*. If you've read a really useful book and it doesn't appear in the following book guide, why not write in and tell us about it? You tell us, we'll tell the world that you told us. Include the name, author, publisher, price and (if possible) the ISBN. Send them in to:

Pat McDonald is a nana
Amstrad Action
4 Queen St
Bath BA1 1EJ.





● Plenty of books tell you how to do this sort of thing. Fair enough, but how about a 3D Freescape game with 666 levels?

Firm favourite

Amstrad have definitely discontinued **the** guide to the CPC's – Soft968, the Firmware Manual. This doesn't have an ISBN, and so doesn't really qualify as a book. Nevertheless it was (and is, to the lucky people who have a copy) an indispensable book for e machine code programmer's.

The firmware calls were carefully set up by Amstrad to be available at any time to machine code programs. They print characters on the screen, read the keyboard, handle the tape or disk drive, and so on. Having such routines removes the need to write them yourself.

The problem being of course, that if you don't know where they are or what they do, they're useless! Certain other books do supply details (notably *Anatomy of the CPCs* and *Ins and Outs of the Amstrad* but these and many others are out of print now).

To remedy this deficiency, I'm going to write something along the same lines.Keep an eye out for *Pat McDonald's Little Black Book*. It should be available by mail order in a few months time.

Tomes of lore



More books than you can shake a library ticket at, in the capable company of PAT MCDONALD

An introduction to CPM+ on Amstrad Computers
by P.K. McBride, Glentop Publishers Ltd
ISBN 1 85181 054 4, £7.95

There is not a lot of literature available for the novice on CPM+, a situation happily improved by McBride's introduction to this operating system. CPM books are more common, but in very few other instances can reference be found to the extra facilities available on CPM+.

As well as detailing the usage of the system, the book gives information on the usage and purpose of the more commonly used CPM+ programs. To many people the book may seem a little too advanced, but it is the best attempt at a tricky subject. GSX, BIOS and BDOS are briefly considered as well.

Further reading:
CPM Plus Handbook
by Digital Research Inc and Amstrad plc, Heinemann Ltd, ISBN 0 434 90321 3 £14.95

Music and Sound on your Amstrad
by Ian Sinclair, Melbourne House
ISBN 0 86161 192 6, £7.95



Sinclair, writing in his usual chatty style, concentrates solely on the sound capabilities of the CPC's. He starts with sound propagation and progresses into musical theory. The examples and diagrams are clear and informative, and while the plentiful demonstration programs may be short they are of high quality.

Coverage is not too deep, yet many substantial noises and musical compositions can be appreciated and adjusted. There's a section set aside for machine code users, too. Readable and informative.

Powerful Programming for Amstrads – Supercharge your 464/664/6128
by W. Johnson, Sigma Press
ISBN 1 85058 046 4, £6.95

This compilation of Basic routines covers many interesting and varied topics, from sorting routines to 3D image manipulation. It is a pity that large, sophisticated programs get no more than a paragraph or two of commentary and explanation.

Johnson deliberately makes it difficult to understand a program without going through it and analysing it. In some ways this represents a challenge, and some of the more obscure routines need a good grounding in mathematics to appreciate them. A book to read if you want to find some programming solutions, but not an ideal step up for a tyro wishing to cut some teeth.

Further reading:
The Amazing Amstrad Omnibus, Martin Fairbanks, Interface Publications, ISBN 0 907563 82 1, £7.95

Advanced Amstrad User's Guide
by Daniel Martin, Glentop Publ. Ltd
ISBN 1 85181 018 8, £8.50

For those who don't want to invest too much money in a reference work this book provides plenty of facts and figures about the CPC's internal workings. Its different sections include Locomotive Basic keywords, the standard character set, machine code digits for simple dis-assembly work and so on.

It also explains the vectors into the operating system, listing such points as entry and exist register conditions. On the whole, though, it lacks the fine detail and informative comment of *Anatomy of the CPC's*. One for those already knowledgeable about computers who wish to study them in some detail.

Further reading:
Amstrad CPC464 whole memory guide
by Don Thomasson, Melbourne House Publishers Ltd, ISBN 0 86161 199 3, £7.95
Ins & Outs of the Amstrad
by Don Thomasson, Melbourne House Publishers Ltd, ISBN 0 86161 190 X, £7.95

Assembly Language Programming for the Amstrad CPC464, 664 & 6128
by AP and DJ Stephenson, Argus Books Ltd, ISBN 0 85242 861 8, £7.95

Many users dream of being truly proficient in machine code. None attain it – the nearest a human can come to understanding the natural language of computers is through assembler. The Stephensons provide a standard, no-nonsense approach to learning machine code, taking the pace slowly and giving the reader time to adjust to this powerful form of programming.

One off-note is the use of a rather old assembler: the listings could have been clearer by using something more up to date. But then the book was published way back in 1986, so some ageing is to be expected. Make no mistake: the path is hard and never ending. But follow this guide and you may become a Z80 assembler programmer.

CPM Plus Handbook
by Digital Research Inc & Amstrad Consumer Electronics plc
William Heinemann Ltd, ISBN 0 434 90321 3, £14.95

This is the official, authoritative work on CPM+, and as as such its pages are packed with information concerning that operating system. The orientation of the

The man who can

Most books reviewed here are hard to track down through a small bookshop, although any title in print can be ordered if the full title, author, publisher and International Standard Book number are known.

The exceptions are Melbourne House Publishers Ltd. The software side of the company was sold to Mastertronics, and the publishing side no longer exists.

If a book is out of print, do not despair. Write to The Out of Print Book Service with details of the book you want, enclosing an SAE. If they come up with the goods, they inform you and quote a price. The minimum handling fee is £5, so the method is hardly cheap, but if you decide you don't want the book you needn't buy it. Write to The Out of Print Book Service, 13 Pantbach Rd, Cardiff CF4 1TU. ☎ 0222 627703

book is towards Amstrad computers, PCW8256 as well as CPC6128.

Nor is it just a reference work. Many sections are designed to educate the user, rather than simply listing page after page of raw information. Included is a GSX supplement explaining how CPM+ can use this system to produce graphic displays. The book represents a solid, meaty read, and is geared towards the programmer of CPM+ rather than the naive user.

Amstrad Book 1: Starting Basic
by Sean Gray and Eddy Maddix
Glentop Publishers Ltd
ISBN 0 907792 39 1, £4.95

Amstrad Book 2: Sound, Graphics & Data Handling
by Sean Gray
Glentop Publishers Ltd
ISBN 0 907792 40 5, £5.95

Well written they may be, but the Amstrad manuals, for many people, lack detail concerning Basic. These two books fill that gap, forming a helpful introduction to Basic programming.

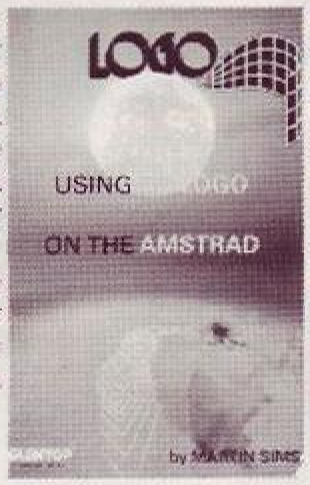


The form of tutorial is to take some substantial projects and carve them up, explaining each Basic keyword as it used. This greatly aids understanding, because you see each command as part of a whole rather than as a separate entity.

Because of the obscure nature of many sound and graphic commands, this method comes into its own particularly in the second book. The scope of both works is not great, but for getting to grips with Basic they can be highly recommended.

Using DR Logo on the Amstrad
by Martin Sims Glentop Publ. Ltd
ISBN 0 907792 56 1, £8.95

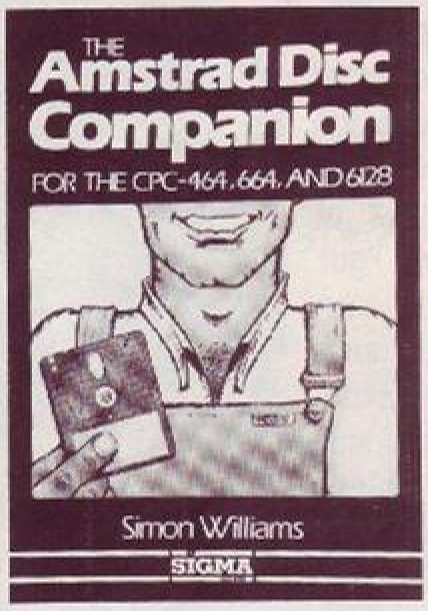
Logo is a computer language designed to be easily learned, visual and powerful. Although every disk-based Amstrad has Logo bundled with it, many people never even attempt to see what it can do. A shame really, because for education and 'fun' it is much better than Basic.



This is one of the best tutorials for Logo around. It is lucid, and makes you feel that much could be done with Logo if more people knew about it. The Amstrad manuals explained a fair bit about the language, but the presentation and scale of this book is so much better.

The Amstrad Disc Companion
by Simon Williams
Sigma Press ISBN 1 85058 034 0, £7.95

Readers often don't want to delve into the workings of optional extras for the CPC's. Generally this is to do with disk drives: they want to see just what the machinery can do in real terms, and how easy or difficult it is to use. This book goes some way toward explaining just what difference a disk drive can make to a computer system.



The Amazing Amstrad Omnibus
by Martin Fairbanks, Interface Publs., ISBN 0 907563 82 1, £7.95

If you want a truly mammoth read then this is the one for you. Unfortunately, however, there is a quite disgraceful lack of boring tables, humdrum statistics and badly presented listings. Instead, all you get is an amazing amount of programs on a bewildering variety of subjects.

What this has that *Supercharge* lacks is a discursive commentary with wit and humour, rather than terse statements of fact. In addition the *Omnibus* is larger and is generally better written. On the other hand *Supercharge's* programs are generally of a more technical nature.

Further reading:
Powerful Programming for Amstrads – Supercharge your 464/664/6128
by W. Johnson, Sigma Press
ISBN 1 85058 046 4, £6.95

Games and Graphics Programming on the Amstrad CPC464, 664 and 6128
by Steve Colwill, Micro Press, ISBN 0 7447 0032 9, £9.95

A subject close to many CPC owner's hearts: making money by writing games. But don't get the wrong idea, this book is included purely for the way it demonstrates graphic techniques. And very well it does it too, with information on sound, screen layout, key reading interrupts etc. It is a fairly fast read, although to get any sort of benefit it will be necessary to digest the information properly.

What lets the book down is the fact that all of the programming is in Locomotive Basic. This makes it more understandable, and the book's value is in laying out and explaining techniques rather than forcing people to find out the hard way. Making money? You'll have to resort to machine code. Nevertheless this book represents a start on that path.

Learning to Program in C
by Noel Kantaris, Bernard Babani Publishing, ISBN 0 85934 203 4, £4.95

The book starts by explaining the concept of statements: routines which are self-contained units. Any program is itself one such statement module. Subroutines are entered by invoking their name.

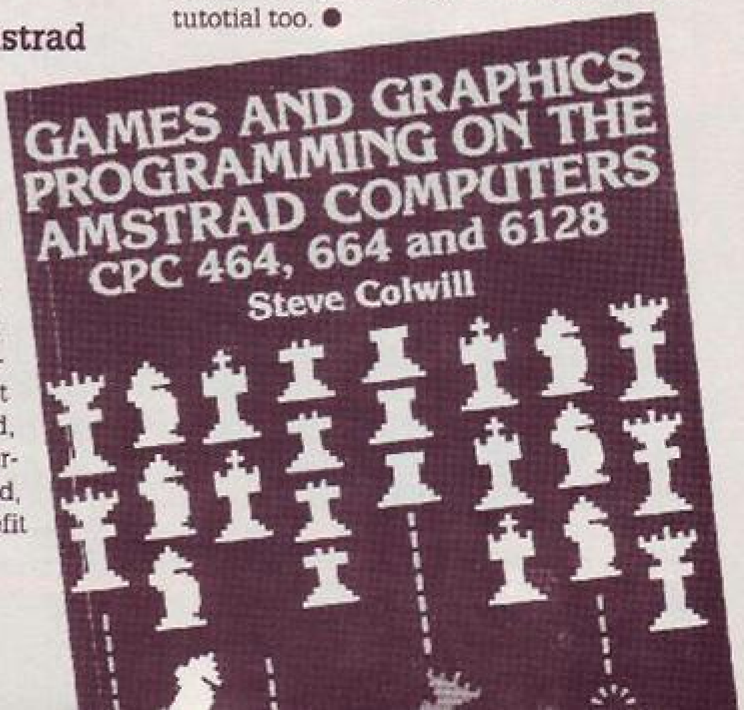
The book goes into detail on data manipulation - things like user defined functions, string handling and arithmetic. Virtually any mathematical statement can be built up using the statement system, and the book is good at explaining how to solve such problems.

Ending on file and database handling, the book gives an excellent view on a difficult language. Throughout it has lots of examples and problems to solve. Lousy paper quality though.

Amstrads and Artificial Intelligence
by Patrick Hall, Sigma Press, ISBN 1 85058 038 3, £8.95 (see special offers!)

If your looking for an alternative to all the telephone directory programs, palette swapping programs and word game programs, this could be for you.

The book covers a wide range of AI subjects, with lots of example programs and anecdotes. Not just a programming course for your CPC, but a genuine AI tutotial too. ●



Snap it up!



So what, you've 'already got a camera'? Bet it's not a camera like *this* one!

It's not every month Raff Cecco brings out a new game, and Hewson and ourselves certainly thought *Stormlord* was a cause for celebration. (Read the full review of *Stormlord* on page 42 of this issue.) So we got together, broke open our favourite piggy bank, and came up with this little item, which we're quite sure will be worth five minutes of your time to enter.

'One condition, though,' said the people at Hewson: 'you've got to make the competition easy so *everyone* gets the chance to enter, OK?'

Now we had to admit we weren't convinced about this. After all, we thought, if we're giving away a camera as neat as this we should make 'em work a little for it! But in the end we agreed.

Here it is, then: the easiest competition in the history of the universe!





●Here's a few shots we prepared earlier!

Rules

1. Employees of Future Publishing, Hewson or Canon UK, or their relatives are not eligible to enter this competition.
2. Entries received after Monday 31 July 1989 will not be eligible.
3. Entries become property of Future Publishing.
4. Judges' decision is final, and no correspondence can be entered into.

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The winner of the *AA*/Hewson *Stormlord* competition receives this superb top-of-the-range Canon EOS 750, with built-in flash. He or she will also win a copy of *Stormlord*.

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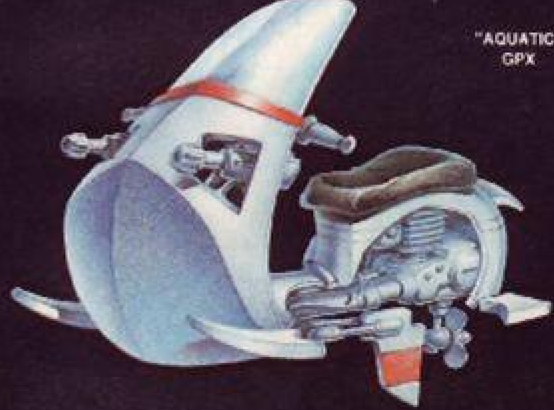
How to enter

Simply answer the following ever-so-easy question on a postcard or the back of an envelope and send it to: *Stormlord Competition, Amstrad Action,* 4 Queen St, Bath BA1 1EJ to arrive by Monday 31 July 1989. State on your entry whether you would like a cassette or disk version of *Stormlord.*

The question: all you have to do is to say which of the following games were written by Raffaele Cecco:
Exolon, Equinox, Cybernoid I, Crazy Cars II, Cybernoid II, Netherworld







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The *alternative* bank manager!



DAVID HOLMES helps you get more from the 6128's 64k extra RAM.

A major feature of the CPC6128 is the extra 64k of RAM. Unfortunately this memory is not easily accessible from BASIC and requires additional software to enable its use. Amstrad supply the *Bank Manager* program which allows the memory to be used for the storage of screens or string data. The screen handling commands have several limitations:

- To store a screen it must be first loaded into the visible screen and then copied into the extra RAM.
- It is not possible to write to a stored screen without moving it into the visible screen area other than by simply copying a whole existing screen with |SCREENCOPY.
- Displaying a screen from store is rather slow and the process involves a 'Venetian blind' effect as the memory is moved.

In addition to these deficiencies the Bank Manager does not allow the storage of machine code programs which can be called in as required. As the extra banks are not cleared when the system is reset, if programs could be stored in this way they would not be lost unless the power supply was switched off. Only the software to retrieve them needs to be loaded again.

The program below sets up an alternative bank management system which attempts to overcome these limitations. (It does not attempt to replace the string storage facilities of Bank Manager.)

Screenplay

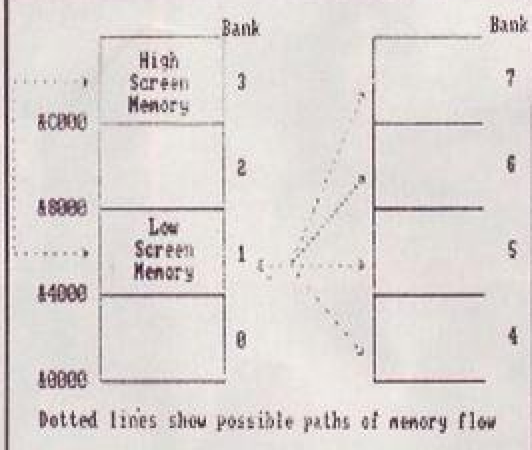
Firstly it is necessary to explain how the screen and extra RAM banks on the CPC6128 may be handled. The 128k of memory consists of eight banks of 16k numbered 0-7. In normal use only banks 0-3 are switched in and bank 3 contains the screen memory from &C000 to &FFFF (see fig.1). This will be referred to as the high screen. It is possible to use bank 1 (&4000 to &7FFF) as an alternative screen (referred to as the low screen) and also to write to one area of screen memory while displaying the other. This is an important feature of the system. The appearance of the screen is determined by two factors:

- The screen base. This may be set at either &C000 or &4000 which then causes either the high or low screen respectively to be displayed.
- The screen offset. If the screen is rolled by printing or listing for example, the start of the screen memory block will not be at the top left corner of the screen. The screen offset tells the hardware where to position the screen memory on the physical screen.

If several screens are to be stored for display it is easier if all are set up with an offset of zero. This avoids the complication of setting different offsets for each screen before displaying it. The Z80 microprocessor can only address 64k of memory at one time, so to allow the use of banks 4-7 some of the existing memory must be exchanged with the bank which is required. This process is called *bank switching*.

Seeing is believing

The CPC6128 ROM has a routine at &BD5B called KL_BANK_SWITCH which allows one of banks 4-7 to be switched into position 1. This block of memory can then be manipulated. The price of being able to manipulate the extra banks more freely than with Bank Manager is



● **Figure 1: dotted lines show possible paths of memory flow**

that only bank 0,the lower 16k of memory up to &3FFF, can be used for BASIC, although potentially 64k of extra machine code and pictorial memory are released. The program sets up a number of RSX's which allow the banks to be moved, displayed and written to. The new commands are as follows:

|GETBANK,n where n is 4-7 corresponding to the bank required.

This command switches BANK n into position 1 (from &4000 to &7FFF). It may then have a screen loaded into it from disk or tape or be written to as described below. It may also have a machine code program loaded into it or assembled into it directly.

|PUTBANK switches out the bank and restores the memory mapto normal.

This should be used to store the screen or machine code immediately after the loading or writing operation has been completed.

|VIEWBANK,n displays bank n on the high screen instantly. This should be executed when the high screen is being displayed. To avoid the 'Venetian blind' effect the screen at &C000 is firstly copied down to &4000. The screen base is then switched to &4000. At this stage the visible screen is not affected. Bank n is then switched in to &4000.

At first thought one might expect bank n to be instantly visible, but this does not occur so simply. Although it is not obvious from the *Firmware Manual* only *hardware* banks 1 and 3 are capable of displaying the screen. If an extra bank is switched in when the low screen is being displayed this screen is still visible but disabled. (|PUTBANK will re-enable the low screen in this situation). To display the selected bank the information is first copied up to bank 3. The new screen is then seen instantly by displaying the high screen. Bank n is switched out again without being modified. If required the original high screen (currently at &4000) may be recovered by switching to the low screen with |SCL or by using |COPYHIGH (see below). The contents of the original low screen are lost.

|COPYSCREEN,n copies the high screen to bank n. This is used if it is wished to store a newly created or updated visible screen. If the screen has been called from store by |VIEWBANK the original screen is still in its bank (from where it was copied). The modified screen can be stored in place of it or in another bank by choosing appropriate values of n.

Take command

To achieve this, bank n is switched in to &4000, the information in the screen is copied into it and then the bank is switched out.

|SCH displays the screen starting at &C000
|SCL displays the screen starting at &4000

These two commands use the ROM routine SCR_SET_BASE at &BC08 to tell the hardware which block of memory to use for the screen.

|WRH allows writing only to the high screen.

|WRL allows writing only to the low screen. These two commands use the ROM routine SCR_SET_POSITION at &BD55. They also set the

```
10 REM BANKRSX
20 REM by D.Holmes
30 MEMORY &3FFF
40 addr=&8000
50 FOR lin=0 TO 35
60 READ byte$,checksum
70 check=0
80 FOR n=1 TO 15 STEP 2
90 byte=VAL("&"+MID$(byte$,n,2))
100 check=check+byte
110 POKE addr,byte:addr=addr+1
120 NEXT
130  IF checksum<>check THEN PRINT
   "error in line" ,1000+10*lin:STOP
140 NEXT
150 CALL &8000
160 PRINT"BANK RSX's SET UP"
170 END
1000  DATA 010980212980C3D1, 744
1010  DATA BC2D80C36680C37E, 1107
1020  DATA 80C3A580C3B680C3, 1316
1030  DATA 9980C3BC80C3C280, 1309
1040  DATA C3C880C3D180C3DA, 1468
1050  DATA 8000000000564945, 356
1060  DATA 5742414ECB434F50, 725
1070  DATA 595343524545CE47, 736
1080  DATA 455442414ECB5055, 730
1090  DATA 5442414ECB434F50, 722
1100  DATA 59484947C85343C8, 855
1110  DATA 5343CC5752C85752, 892
1120  DATA CC574950C500FE01, 896
1130  DATA C2DE80CD8D80CDC2, 1417
1140  DATA 80CDA580CD9980CD, 1317
1150  DATA BC80CDB680C9FE01, 1287
1160  DATA C2DE80CDA580CD8D, 1388
1170  DATA 80CDB680C921FFFF, 1387
1180  DATA 11FF7F010040EDB8, 885
1190  DATA C92100401100C001, 508
1200  DATA 0040EDB0C9DD7E00, 1025
1210  DATA FE04DADE80FE08D2, 1298
1220  DATA DE80CD5BBDC93E00, 1098
1230  DATA CD5BBDC93EC0CD08, 1153
1240  DATA BCC93E40CD08BCC9, 1117
1250  DATA 3EC0210000CD55BD, 766
1260  DATA C93E40210000CD55, 650
1270  DATA BDC9CD14BCC9CDB6, 1391
1280  DATA 80CD0BBCCD08BC21, 966
1290  DATA 008106197ECD5ABB, 768
1300  DATA 2310F93E07CD5ABB, 851
1310  DATA 3E42CD1EBB28F4C9, 1035
1320  DATA 504152414D455445, 591
1330  DATA 52204552524F522D, 553
1340  DATA 5052455353204553, 581
1350  DATA 4300000000000000, 67
```

● The Basic listing for The Alternative Bank Manager

screen offset to zero for consistency with other screens. This routine does not inform the hardware of the change in screen position but allows printing, drawing etc. to the relevant block of screen memory even if this is not currently visible. When the screen is constructed it can be displayed instantly by executing either |SCH or |SCL as appropriate. These commands cancel the effect of |WRH and |WRL and allow writing to both screens. It is possible to create smooth animation effects by changing one screen while displaying the other.

|WIPE clears the screen to ink 0 and zeros the screen offset. It is important that the screen offset is set to zero before a screen is constructed (either visibly or invisibly) or displayed using |VIEWBANK. If this is not done the screen image may be disrupted either on display or following any attempts at further manipulation. A CLS command will not zero the screen offset after rolling.

|WIPE ensures that the screen starts at the correct point and should be used if the screen has or may have rolled. A MODE command may be used instead of |WIPE but this destroys any windows that may have been set up. If an invisible screen is being constructed for storage in a bank, or for instantaneous display after issuing a |WRL or |WRH command, CLS must be used if the screen is to be cleared. (|WRH or |WRL have already set the offset to zero). If |WIPE is used it informs the hardware of the screen base and displays the wrong screen. This also occurs if a screen being constructed invisibly is rolled. Rolling a visible screen during construction alters the offset and cause the invisible screen to be disrupted if it is then displayed with |SCL or |SCH alone.

Provided that the currently invisible screen was set up with a zero offset it can be rescued by displaying it with |WRL:|SCL or |WRH:|SCH. If |WRH or |WRL are used alone in this situation to write to the invisible screen without displaying it, the offset is set to zero and this screen can be successfully written to.

Unpredictable results

The visible screen however is being constructed with an unknown offset and attempts to modify or manipulate it lead to unpredictable results when other commands notify the hardware that the offset has been zeroed. These complications make it worth taking care to avoid rolling during screen development! If a rolled visible screen must be cleared to a paper colour other than 0, CLS may be used following the |WIPE command. |COPYHIGH copies the contents of the low screen to the high screen.

To recover a high screen after |VIEWBANK has moved it down to the low screen or to allow storage of a constructed low screen, first use |SCL to make it visible, |COPYHIGH to move it and |SCH to display the high screen. It is possible to use |COPYHIGH without using |SCL first but this brings back the 'Venetian blind'!

Once in the high position the screen can be modified if required and stored with |COPYSCREEN.

These commands may be used to write invisibly to a stored bank as follows:-

```
10 |GETBANK,n :REM Where n is the bank to be
   written to
20 |WRL :REM Allow writing to lower invisible
   memory block
30 CLS :REM If the screen is to be cleared
40 GOSUB 100:REM Program to construct screen
50 |PUTBANK :REM Store bank
60 |WRH :REM Allow writing to the high screen
   if required
70 END
100 REM Screen Construction Program
200 RETURN
```

Avoiding loads of trouble

To load a binary screen file from disk or tape to a bank without it being visible:-

```
10 |GETBANK,n
20 LOAD "SCREEN",&4000
30 |PUTBANK
```

Machine code may be loaded as above or assembled anywhere into the &4000 to &7FFF block by using |GETBANK before entering the assembler. The code is assembled and then |PUTBANK is issued. It may then be fetched with |GETBANK and CALLed when required.

To save a stored screen to disk or tape:

```
10 |GETBANK,n
20 SAVE"Screentitle",b,&4000,&4000
30 |PUTBANK
```

Machine code may be saved in the same way by modifying the start and length values as required.



To save the high or low screen to disk or tape:

```
10 SAVE"Screentitle",b,&4000 (low
   screen) or &C000 (high screen),&4000
```

Screens may be saved and loaded in any mode but the original mode must be set before a screen is displayed.

To set up the RSX's type in the listing and SAVE it. RUN it and correct any errors in the DATA statements. SAVE a final corrected version. Delete the program with NEW and the commands are available to test the imagination! If any parameter errors are made all banks are put back to normal, the screen being written to is made visible, a message is displayed and a warning tone sounded. Pressing ESC returns to BASIC.

I'm interested to hear of improvements to the *Alternative Bank Manager*: a follow-up article is planned. ●

● For a free copy of the full Assembler listing write to: *Bank Manager Listing*, AA, 4 Queen St, Bath BA1 1EJ. However, you *must* enclose a decent sized SAE!

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FORUM

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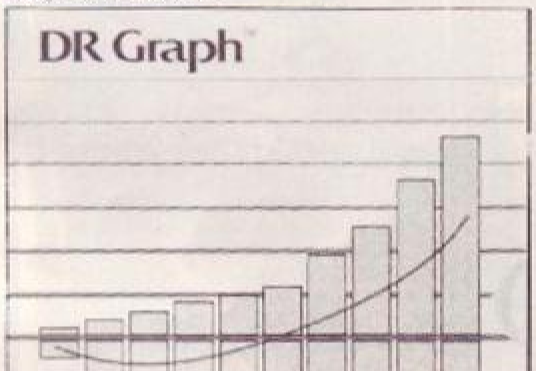
Welcome once more to *Forum*, where Pat does his level best to answer your questions and pass on your hot tips on *all* aspects of CPC computing.

●(Not) labour saving

I use *Supercalc2* with Digital Research's program *DR Graph* under CPM+, and have followed instructions carefully concerning the use of the Superdata Interchange Format. But I keep coming up with 'File Corrupted' or Unable to open File' when I try to access *Supercalc*'s data on using *Dr Graph*.

I thought it might be the difference between the Data and System Formats (*Supercalc* and *DR Graph* are on System formatted disks, data is on Data formatted disks on drive B:) so I used system to system and data to data transfers using *PIP* – but still the same thing happens!

I've stripped the borders and removed unnecessary cells, columns, rows and so on, so that prior to SDFing the *Supercalc* data for conversion to *DR Graph* use with values only, all goes well. But when it comes to selecting option 2 in *DR Graph*'s Supercalc SDF option, I just get the response 'Unable to open file' (if on Drive A:), or 'File Corrupted – unable to open File,' if on Drive B:.



● *DRGraph* – causing loads of trouble

Now, I do not mind re-typing in data in small doses and I am quite experienced with CPM and computers – but when I had this much, I hoped that using the SDF would considerably ease my burden! I am stuck, so I call upon your wise gurus to enlighten me, or cue me in something I may have overlooked. If not, how about throwing this one out to the readership.

Cheers all, down the hatch with the Yetties and scrumpy!
James Haswell, Camberley

I didn't know about this problem importing SuperCalc *data into* DRGraph. *One possible source of information might be the CPM User Group (72 Mill Rd, Hawley, Dartford, Kent DA2 7RZ). Failing that, have any of our readers either experienced – or even better, solved – this difficulty?*

●Is there a market?

At the beginning of this year I started writing Basic programs, mainly educational, for my seven year old son. They are not perfect, but after viewing some of the so-called professional software on the market, they are not too bad either. The proof of the pudding is in the eating, and I have known him to sit at a maths routine I have written for anything up to an hour.



● Database's surprise chart hit *Funschool 2*

This new-found talent of mine therefore raises two questions which I hope you will be able to answer for me. First, as I have decided to try and sell some of my work, should I get it copyrighted first and if so how? Second, is there a guide on the market to give me some idea as to how much I should expect from any such sales, to software houses and so on? Being a novice I'd hate to get done first time out.

Colin Smart, Norwich

Copyright is placed on a piece of writing (programs are covered under this classification) simply by sticking the message 'Copyright 1989 Colin Smart' somewhere in it or on it. If you place a copy like this with a solicitor or (if you're really nervous) in a bank vault, there shouldn't be any problem proving that the copyright was yours when it was written.

The only problem is, even if you can prove that the right to copy a program is yours, litigation through the courts may be too expensive to be worthwhile. History is littered with such instances, where one party or the other has behaved badly over such a small amount that the only winners in the end are the solicitors.

As to a guide, looking back through AA I spy The software Business *by Meyer Solomon (BBC publications, £5.50). Apparently most of it is devoted to waffle on program design, with little solid info.*

One thing I can tell you is that there is a demand for high quality educational software (witness Database' Fun School 2 *entering the charts recently) and that there isn't much available. The biggest difficulty, it seems, is telling customers that you have something worthwhile. Look out for an educational special towards the end of summer.*

(By the way, Steve would like me to thank all the people who responded to our request for information on educational software and the use of CPCs in schools. We're working on that special at the moment, but as you can appreciate exams and summer holidays are getting in the way. But we haven't forgotten!)

●Power to the people

Why hasn't my Amstrad got a CMOS memory? I'm fed up with programming my latest mega utility, only to have it snuffed out by the meter demanding more fifty pences. Could you please get one of your hardware genii crack commandoes to design a memory that doesn't go blank with no electricity, for under £30 with a through connector?
Les Carter, St Helens

You're not asking a lot, are you Les? Datel's Rampack (which is just a plug-in effort, and doesn't try to replace the internal memory) costs £49.95. A more expensive CMOS memory unit – with battery backup – would almost certainly be more than £30.

There's not really a lot of point to it. Supposing that you do have it, and the power goes – what then? The processor and other internal chips are not CMOS, so all you would be left with would be a dead keyboard. When power returned your computer would be reset automatically.

What would be much more useful from your point of view would be a temporary power source, capable of taking over automatically when the mains supply goes down. I'm afraid that they cost a few hundred pounds for even a cheap one.

Perhaps more frequent saving would be the answer to this very common problem?

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●No ESCape

While reading last month's *Forum* I noticed that at the end of the letter 'Y Fronts in a twist', you had written that for the corrected program tape users had to break out of the program (by pressing **ESC** twice while **CAT**aloging a tape, and then type **GOTO 20**.

If you include an **ON BREAK GOSUB** routine routine you can then stay inside the program. I also had to use this approach in the *Easibase* ptogram a few issues back, so I could include a **CAT** routine. Here's a demo of just what I did:

```
10 MODE 1
20 IF INKEY(47)=0 THEN GOSUB 100 ELSE PRINT
   "Press space to CAT":PRINT "Press ENTER to end
   program"
30 IF INKEY(18)=0 THEN END
40 LOCATE 1,1:GOTO 20
50 END
100 ON BREAK GOSUB 200
110 PRINT "Press escape twice to end the CAT"
120 CAT
200 CLS:RETURN
```

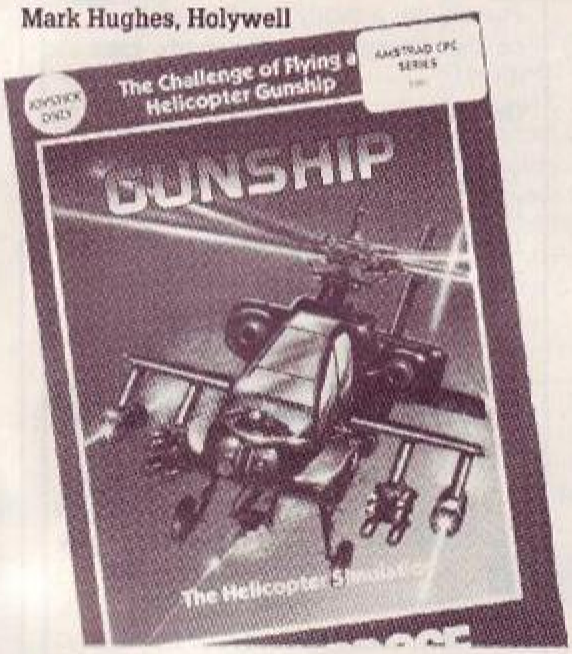
Rick Plappert, Southend-on-sea

Nice one Rick!

●There it was – gone!

One fine morning, my Gunship tape failed to load. What should I do to play my favourite game again? Will *Conflict in Vietnam* be available for the CPC? Where can I get some details on the *Multiface II?*

Mark Hughes, Holywell



● *Gunship* – did a runner

Take the faulty tape back to the supplier, ie the shop where you bought it, as they are the ones who should replace it. We haven't heard anything about Conflict in Vietnam, *but if we do it shall be featured in* Amscene. *Romantic Robot, who make the* Multiface, *can be contacted on ☎01 200 8870*

●Hard info

I have a 464 plus disk plus 64K of extra memory. Is it possible to use the printer port as an expansion port? I have been told that this isn't possible, but surely if the relevant address could be accessed then words could be written to or read from it.

Is there a concise memory map that shows where the status register lives and would it show the location of the printer and expansion ports? I don't mean the location where the firmware accesses them, I mean so that they can be accessed directly from machine code thus:–

```
LD HL,EXP_PORT_ADDR
LD (HL),word
```

I want to find out about the addresses for several hardware projects that I have in mind.

Dave Jackson, Norwich

No, it isn't possible to use the printer port as a proper expansion port, simply because there is no internal connection for the computer to 'listen' to what a printer tells it – the information flow is nearly always the other way. You can of course use it just for sending out information – that's what it's designed for.

A memory map of the highest detail, showing each address and what it's used for, would not show any trace of the hardware. It isn't memory mapped.

Instead it is connected to various Input/Output ports, which are similar to memory locations but have their own set of commands to put things in and take things out.

For instance, the printer is mapped out to port &EFXX. Sending to any of the 256 ports from &EF00 to &EFFF is OK, since the information will still go to the printer.

The correct way to access a port (for instance, send &20 to the printer port) in machine code is to use:–

```
LD B,&0EF
LD C,&20
OUT (C),C
```

For input, use:–

```
LD B,&0EF
LD C,&20
IN (C),C
```

I would recommend that you investigate a book on Z80 machine code to fully appreciate these commands. A full list of port addresses that are usable follows. **Do not use any others:** *serious damage could result.*

	INPUT	*OUTPUT*
7FXX	DON'T USE	Video Gate Array
BCXX	DON'T USE	CRTC Register Select
BDXX	DON'T USE	CRTC Data
BEXX	CRTC Status	DON'T USE
BFXX	CRTC Data	DON'T USE
DFXX	DON'T USE	Expansion ROM Select
EFXX	DON'T USE	Printer Latch
F4XX	8255 Port A Data	8255 Port A Data
F5XX	8255 Port B Data	8255 Port B Data
F6XX	8255 Port C Data	8255 Port C Data
F7XX	DON'T USE	8255 Control
F8XX	Expansion bus	Expansion bus
F9XX	Expansion bus	Expansion bus
FAXX	Expansion bus	Expansion bus
FBXX	Expansion bus	Expansion bus
FFXX	Not used	Not used

●Look what I've found!

I recently bought the game *Wec Le Mans.* I reset the computer when I had finished playing it, and decided to play another game. However I forgot to remove the *Wec Le Man* tape.

The next thing I know the computer was loading *Amchange.* I let it load, and when it had I noticed that the program was in French. So I couldn't understand it that well.

Deciding to load *Robocop* (which is produced by Imagine, who also did *We c Le Mans)* I reset the computer again. Sure enough, on the end of the tape was *Amchange.*

Is it on the end of all Imagine's recent games? What does it do?

Benjamin Heyes, Bradway

Haven't the foggiest, Ben. Mystery here, readers...



● Ocean's *Robocop* and *WEC Le Mans:* both have *Amchange* hidden inside – but what is it?

Nasty letter

Ha! So, your vaunted listings are put out to a critical world, and what do we see? BUGS! In your much publicised listing the *AA Sprite Editor*, we couldn't actually see what we were editing. And in your *Typewriter* program, there was a mistake in line 110 which could have meant that 464 owners wouldn't have been able to use it. What have you got to say for yourself, Pat McD? Here are the corrections, by the way.

```
792 bigx=192:FOR x=0 to 63 STEP stepno:littlex=x
    :littley=400:bigy=358
794 FOR y=0 TO 63 STEP 2:littley=littley-
    2:paint= TEST(littlex,littley):bigy=bigy-8
796 IF paint > 0 THEN GOSUB 810
798 NEXT y:bigx=bigx+stepno*4:NEXT x
```

And for *Typewriter*:–

```
110 IF LEFT$(h$,1)="y" OR LEFT$(h$,1)="Y" THEN POKE a+8,&A4
```

Ivan Obviouslymadeupname, Antarctica

Ok, I'll admit that the listings as printed were not as finely tuned or polished as they could have been. I'm sorry for that. On the other hand, at least they would have worked as printed. Thanks for the amendments (also thank you Jens Skinnerup, who sent in a similar tip) and enjoy spending the £15.

I wanna...

Could you tell me where I can get a hex loader and/or a mnemonic loader? I've just started to learn machine code, but the book I've got doesn't have the required programs. Finally, could you advise me on a disk drive and printer which cost less than the £200 mark?

Richard Marsh, Crewkerne



● A decent second drive – Microstyle's is around £115, and that includes Ramdos, too

Well, if you really want to just use a hex loader, then Z-Pack could be what you're looking for. It features a memory editor, disassembler, calculator and breakpoints for debugging code and costs £10.95 from Zenith software, 11 Bude St, Applodore, Bideford, N Devon EX39 1PS. Unfortunately Z-Pack does not contain a what you call a mnemonic loader, more commonly known as an assembler. A roundup of good assemblers was published in AA39.

Your query about a disk drive is a bit vague, because I've no idea if you mean a first drive (for a 464) or a second drive (for any CPC). First drives, or DDI-1's, cost around £140 and are available from good mail order suppliers – SDC Micros or MJC supplies. A good choice of second drive would be the 3.5' from Microstyle (☎0274 636652). At only £89.95 without software – and it's usable without any – or £114.90 with Ramdos, it must be one of the cheapest going. As for a printer: check the AA Buyers Guide at the back of this and every issue.

Covered in confusion

I have a CPC6128 and a Yamaha PSR-11. Could you please tell me whether or not the PSR-11 is a Midi instrument? If so could I connect it to the 6128 via a Miditrack Performer?

Andrew Morral, Plymouth

All Midi instruments have a five pin DIN connector on them marked 'Midi'. If the PSR-11 has this, then yes, a 6128 can be used to play it using a Miditrack Performer.

Wrong ribbon

I own a 464 and a DMP1 printer which I purchased together some three years ago. Does anyone have any idea as to why, when I attempt to purchase a replacement ribbon for this printer, the one specified in the catalogue does not fit? I have discovered that a ribbon supposed to be for a Commodore printer is the same as the one supplied with the printer. Why is this?

David J Candlish, Coventry

The Commodore MPS801 is very similar to the DMP1 – presumably they were both designed by the same company. The latter has now been discontinued by Amstrad, due to the popular sales of the DMP2000 and DMP2160. S, if you want a ribbon that fits, ask for one suitable for an MPS801.

Sublime, downwards

To load tapes on a 6128, do I need a special lead or a special cassette recorder?

What's the difference between `CALL &BB5A` and `CALL BB5D`?

How do I format a disk so that a menu program will load when `|CPM` is typed?

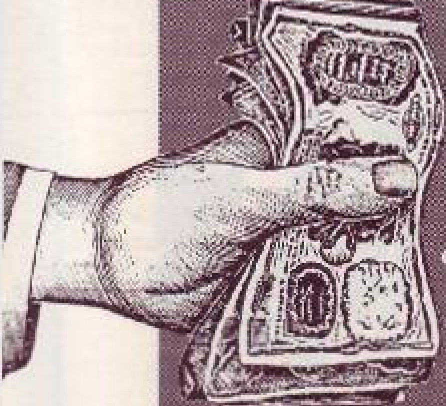
How come *Trivial Pursuit* can actually put writing on the screen when somebody `CAT`s the disk?

George Lovel, Peterborough

You need a special computer-to-cassette lead. Curry's do one for approximately £2.50. The firmware at &BB5A (`TXT OUTPUT`*) performs a lot of checking to see just where the character to be printed is going. In contrast, &BB5D (*`TXT WR CHAR`*) just slaps it down on the currently selected window, and doesn't bother to even preserve any registers.*

The format must be System, but you will need to stick your menu program (or a short loader for it) at the beginning of the disk, ie track 0, sector 41. The Trivial Pursuits *trick is much easier: all you do is alter the names of files so that they contain control codes to change the screen colours and where text is to be printed.*





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THE LOOK

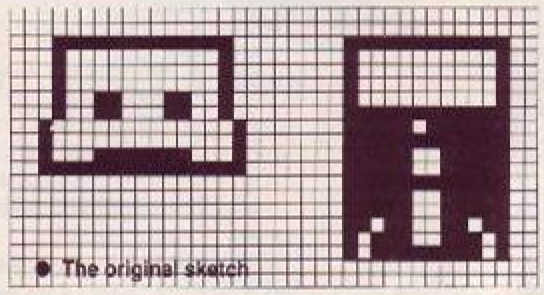
Where to stick your sprites – PAT McDONALD gives the orders

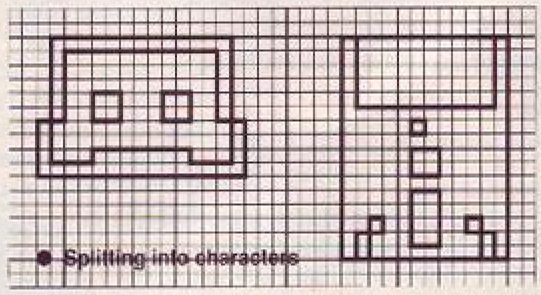
As promised in last month's *Look* – which you may need to glance back over to understand some of the terms here – we're going to go through some examples of designing screen graphics. These simple monochrome items shouldn't be too tricky.

Glance at *TypeIns* this month, where there's a little program called *Symbolizer*. This isn't particularly awe-inspiring to use, but could save you an awful lot of time when you're attempting to realize your pixellated dream. Instructions on the controls used are included with the program, so here's something more: an example on using it.

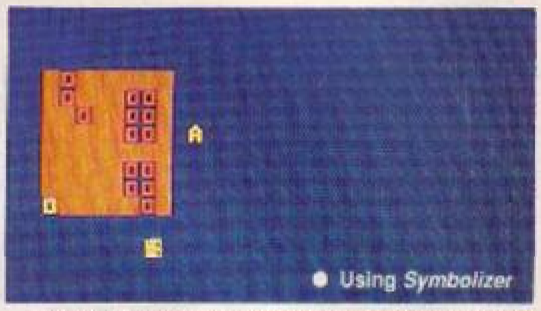
No worries!

First we need to decide on an image to copy. After some thought on the demands of the readership, let's agree that a small icon of a disk and tape seem appropiate. As stated last month, the first stage is to create a drawing on graph paper, to get the proportions right:–


● The original sketch


● Splitting into characters

Then it becomes necessary to split the whole drawing into character-sized shapes. They're based on an 8 X 8 grid, so the original diagram is divided up like so:–


● Using *Symbolizer*

After that we need to choose which characters to overwrite with graphics data. One thing to remember is that it's generally a good idea to reserve certain characters – letters, numbers and punctuation mark – for your own uses. 'Usable' characters are therefore from 127 upwards, so reserve these by using `SYMBOL AFTER 127`.

When you come to use *Symbolizer*, the program starts editing at character 65, which is 'A'. How can you get round this? Supposing you do want to begin editing characters above 127, simply change line XX to read:–

THE GALLERY




● Unusual angle to draw a car: nice one Marcus Jones of Crediton

● Fancy yourself as an artist? Then get cracking! Let us have your very best work at the *AA* office, and you could earn yourself *£20!* Send entries – together with a short note telling us which art package you used, and an SAE if you want the pictures back – on disk or tape to:

Pat McDonald's *The Look*
Amstrad Action
Future Publishing
4 Queen St
Bath BA1 1EJ

● Two commendable efforts from the hand of J Shaw from Farnborough






● 'C'mon guys send in you LOOK entries!' says Roger Rabbit, excellently depicted by Paul Fong of Liverpool

That way you begin at the character which is specified as `n=127:reservend=n-1`.

After inputting all the character shapes (and getting a few wrong – I know I do) you no doubt want to save the information to tape or disk. That's covered sufficiently in *Type-Ins*, so I won't bother here.

The final stage, after getting all the characters in, is working out some programming techniques to print them in the right place at the right time. This is the interesting bit...

Any time, any place, anywhere

It is impossible simply to fit whole screens of graphics into the machine in their 'raw' state. Each takes 16K, which means a maximum of three in a 64K computer (assuming you want some program in there too). The one idea which makes virtually all games possible on computers like the CPC is *modular design*.

A few points to note before we go on. First, *Symbolizer* runs in mode 1, because it's the easiest to use. The characters produced by the program, however, can be printed without hitch in any mode, any colour.

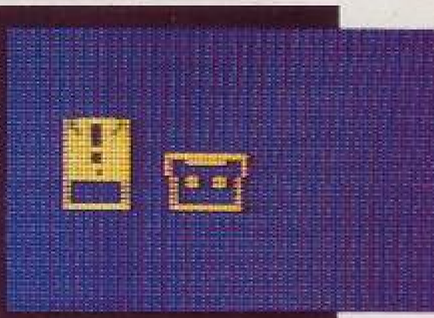
This 'any time, any place, anywhere (there's a wonderful world you can share)' *(thatsh enough Martineesh – ed.)* simplicity is one of the basic strengths of the printed character system. Although it's difficult to have any one character in more than one colour at once, many programs use it to great effect.

Icons: see clearly now!

Icons, drawings which represent certain programs or features, and are often used in serious software for WIMP (or 'window, icon, mouse, pointer') applications, to make selecting an option easier to remember.

Icons a) make programs look better and b) give novices a better chance of guessing what an option is for. When 'files access' is represented by a disk icon, people find it more intuitive to use.

So icons are a good idea in programs, replacing onscreen text with graphics. And since they're usually as simple as possible and therefore two tone efforts, it makes sense to draw them using characters rather than sprites, thereby saving on valuable memory.



● Nice one John – how about one of a ROM?

Incidentally, the way to acheive multi-coloured characters is to print one normally, and overlay it subsequently with more characters in different colours using XOR printing mode. To turn this on use

```
PRINT CHR$(23);CHR$(1);
```

When you want to print normally again, type

```
PRINT CHR$(23);CHR$(0);
```

Needless to say this takes fancy programming, especially when printing *modules* – collections of characters arranged to form individual images on their own.

Here is a simple program which prints out the disk/tape icon:–

```
10 MODE 1
20 LOCATE 1,1
30 FOR x=0 TO 4
40 FOR y=0 TO 4
50 LOCATE x,y:PRINT CHR$(127+x+(y*5));:
60 NEXT y:NEXT x
```

The effect is fine, but when printing out modules in your own programs you'll want a lot more. This little program has its limitations, not least of which is that it always prints the icon in the same position, and always assumes that the characters are one particular set of numbers.

What's needed is a way to store a) the pattern of a particular module on the screen, and b) where each set of characters actually is. That's next month in *The Look*. ●

● Next month in *The Look* we look at a module designer that will get you scribbling furiously on graph paper



● Our first repeat winner, well done Rhyl resident James Garside (Main pic)







● Marcus Jones again, with a delicate rendition of a portrait (Top)

● Woger Wabbit again! This time by Richard Heasman who lives in Buntingford (Middle)

● Very good picture of the famous Dire Straits image. Credit goes to Peter Clarke of Calne (Bottom)







● Three fun pics here. The top one was drawn by Marcus Jones: Pacman comes courtesy of David Knight from Birmingham: and the monster at the bottom (my fave) was done by C Pounder of Doncaster

ACTION TEST

Is it a bird? Is it a plane? No it's TRENTON WEBB, Super Reviewer!

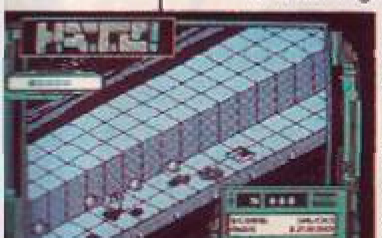
H.A.T.E.

Gremlin● £9.95 cass, £14.95 disk joystick/keys

AA RAVE!

339 years in the future, audio/visual training aids and military simulators have progressed a bit. Fighter pilots and tank commanders don't get experience from being strapped into obscure boxes with flickery screens to watch – they get sent to Stripworld, an obstacle filled planet that tests even the toughest...

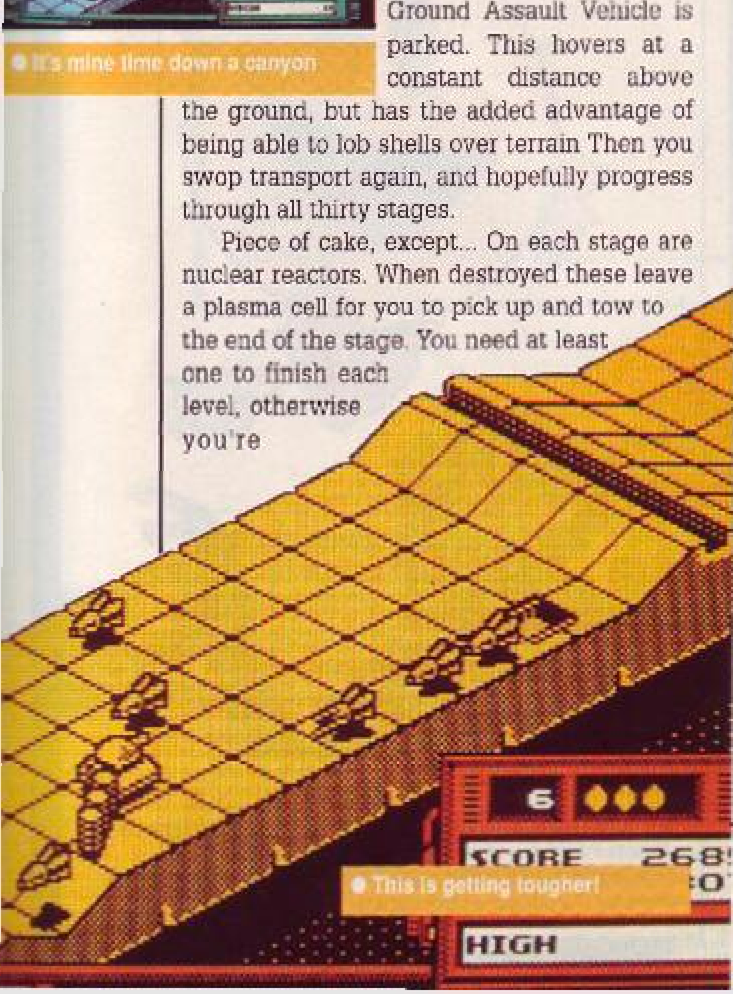
Hostile All Terrain Encounter is a shoot em-up based around this simple scenario. Your mission starts off on a runway in zone one, with a Star Fighter sitting on the tarmac. The screen starts to scroll diagonally and it's laser time!



● It's mine time down a canyon

After annihilating the alien defences on the first stage, you land automatically at a shorter airstrip where a Ground Assault Vehicle is parked. This hovers at a constant distance above the ground, but has the added advantage of being able to lob shells over terrain Then you swop transport again, and hopefully progress through all thirty stages.

Piece of cake, except... On each stage are nuclear reactors. When destroyed these leave a plasma cell for you to pick up and tow to the end of the stage. You need at least one to finish each level, otherwise you're blown up at the last barrier and lose one of your four lives. Plasma cells, however, absorb one hit on your vehicle: destroying themselves in the process.



● This is getting tougher!

Pitted against you are various simulated alien hazards: mines, fighters, missiles, bolts and saucers, to name a few. These pop up out of sliding trapdoors, and would be easy to zap if there were not **quite** so many of them.

Because *H.A.T.E.* is a simulator, losing all four lives doesn't automatically kill you: if you've managed to get past level two then you're sent back two stages. Two scores are shown to reflect this: the best you've managed on the mission, and your present score.

SECOND OPINION

"It's simply too frustrating to get to level six or seven and then be sent back to stage two! I can stand the failiure, it's the being destroyed on the finish line that gets me. Great tune spoilt by a frustrating game. TW

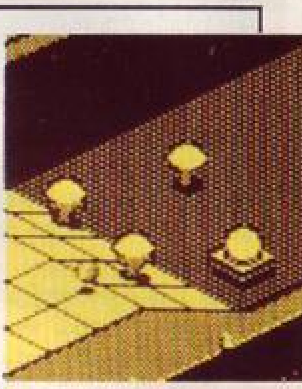
GREEN SCREEN
Mostly OK

Although four colours are used for the whole screen, just two appear on the playing area. All the ships and aliens are very well designed though, and are distinct from the background. Occasionally you get disorientated, unsure of what's in front of what: more colour could have prevented this. The scrolling is silky smooth, with no glitching on the playing area at all.

The 3D Man

Vortex software have done similar games in the dim and distant past (*Highway Encounter*, Mastergame *AA2*: *Alien Highway*, Rave *AA9*). All have been designed by Costa Panayi, a programmer of considerable worth. Let's hope his next effort isn't so long in coming!

One outstanding part to the game is the sound. Benn Dalglish has done something really special with the music soundtrack. In fact, I suspect that the loudspeaker gets a little bit overloaded at times! The spot effects are boisterous too, and turning up the volume gets the neighbours complaining.



● Lobbing shells at the aliens

H.A.T.E. starts off easy, but you soon need some fancy stunts with your vehicles to keep progressing. Games can last a long time because of the send back feature, and it's possible to come back fighting from a losing position because excess plasma cells mean extra lives. The game's very engrossing, for a shoot-em-up!

The only problems are that it doesn't look particularly special for an '89 game, and if you get through all 30 levels you probably wouldn't want to play it again. Well, not much anyway. **PbM**

FIRST DAY TARGET SCORE
Stage 11 (Fighter Pilot)

The Verdict

GRAPHICS **71%**
- ☐ Nice scrolling.
- ■ Looks too plain.

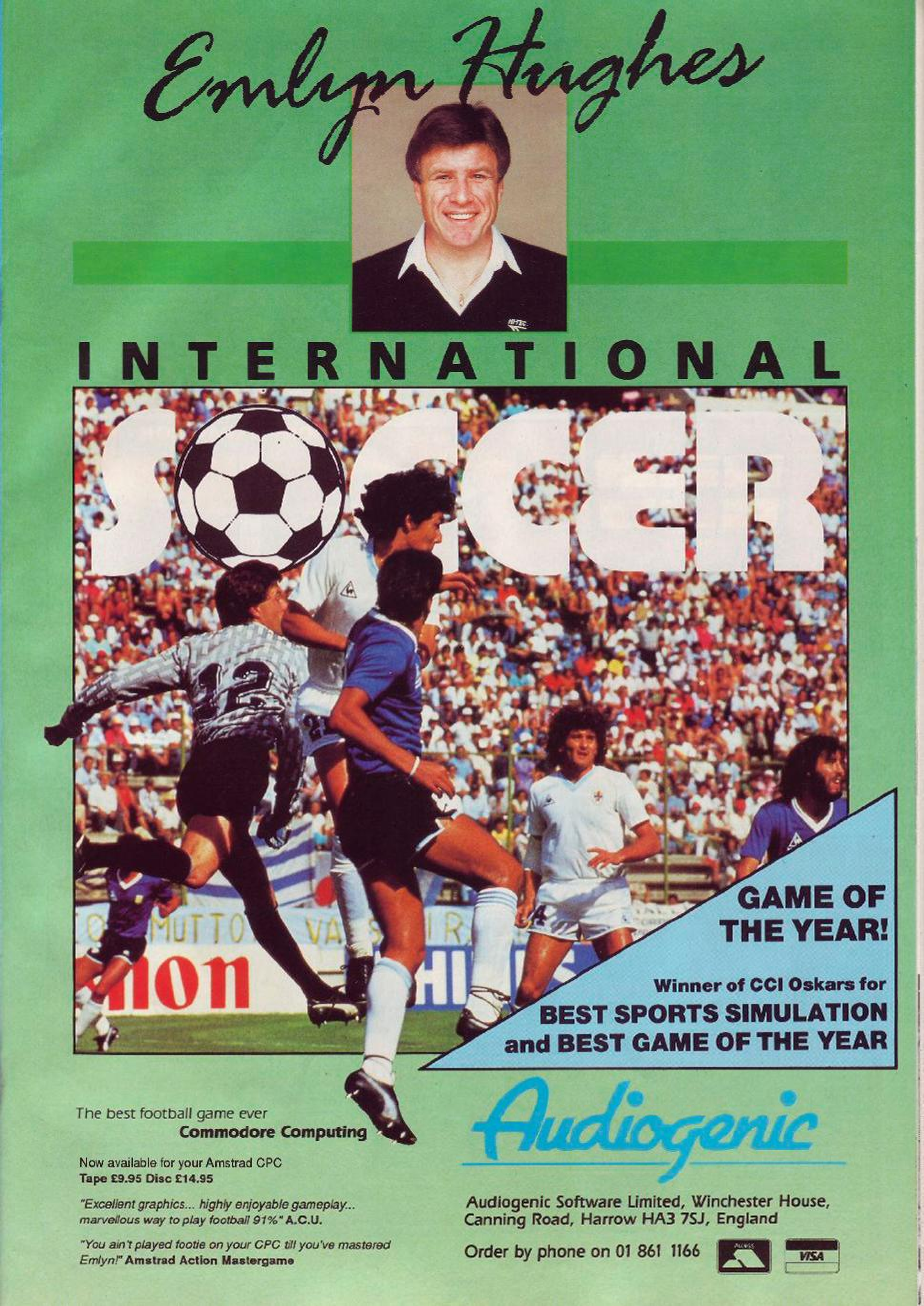
SONICS **90%**
- ☐ Blast to the beat.
- ☐ Good effects.

GRAB FACTOR **85%**
- ☐ Anarchy rules.
- ☐ Action rarely stops.

STAYING POWER **82%**
- ☐ Send back rule keeps you playing.
- ■ Not too difficult to complete?

AA RATING **81%**

- ☐ More please Mr Panayi!


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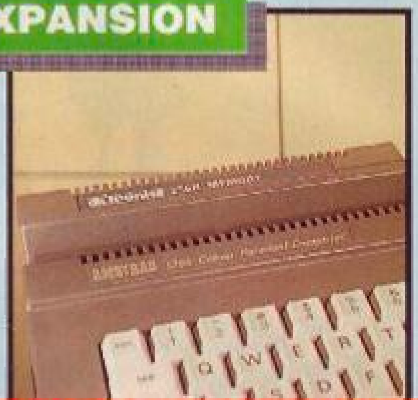
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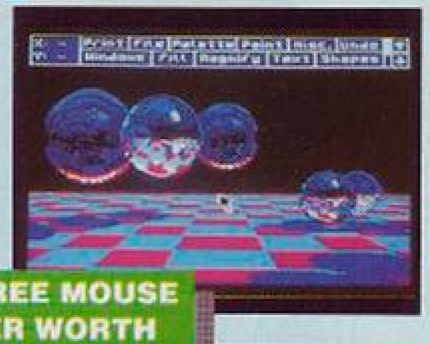
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STORMLORD

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● What's a Stormlord urn? About £3.56 a week.



● Fairy dangerous these bees!



● There's not mushroom up here!



● Red Dwarf meets Fairy Queen.

Have you ever wondered what happened to all those fairies who used to live at the bottom of the garden when you were a kid, but who haven't shown their wings for ages? Did the tooth fairy join BUPA? Has the Fairy Godmother gone to spend her days at a rest home? Did they all hang up their wands as soon as we stopped believing in them to join the dole queue behind Father Christmas? No, they all packed their bags and fluttered off to Hewson to take a starring role in *Stormlord*.

The story behind *Stormlord* is as simple as the gameplay is difficult. These poor fairy folk have been kidnapped by some fantasyland mobster Queen and *Stormlord*'s job is to rescue them as quickly as poss. All that stands between him and completion of this mission are a few million tricks, traps and beasties, more suited to Elm Street than fairyland.

The first thing 'Stormy' must do is to play find the fairy, which isn't easy. All the little ladies (who insist on remaining naked even when trapped by killer bees!) have been stashed away in boltholes throughout each level, either behind locked doors or guarded by some creature. To get to them *Stormlord* has to fight his way along a horizontally scrolling landscape throwing magical thunder bolts and using special spring boards to catapult him between sections. There you are innocently standing on this plank when AAAAAAGGGGHHHH!! You're flying through the air with the greatest of ease, and not a trapeze in sight you daring young man.

The game starts with the fairies friend trapped between an infeasibly vast vase and a positively huge toadstool. After leaping upon the fungi, you make your way along until the path is blocked by a spore spitting shrub (the first of those tell-tale signs you're playing a Cecco game). Your little 'Stormlord' has to time his passage to the split second, or he'll be pushing up the

AA MASTER GAME

SECOND OPINION

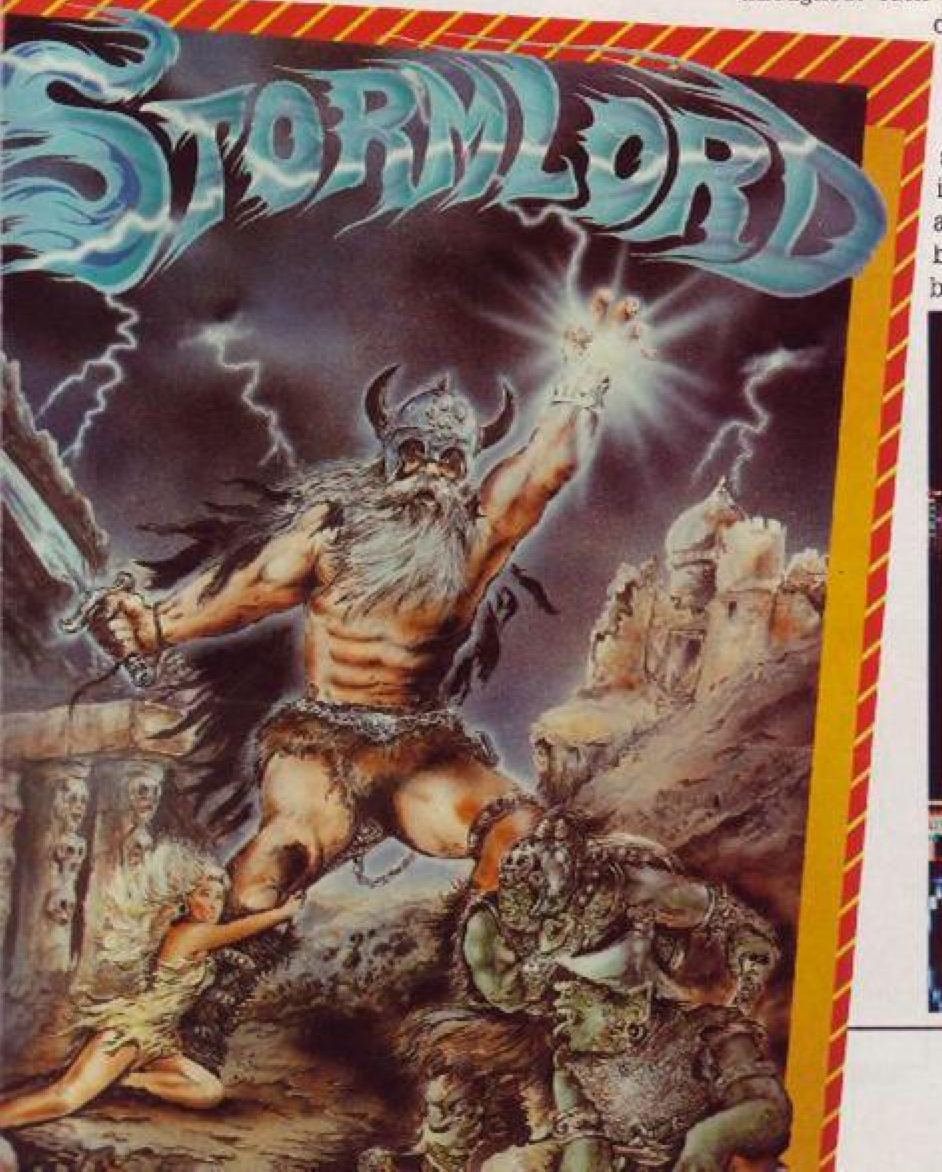
"Stormlords' appeal in no way comes from the gameplay. There are dozens of similar platform games around, but none of them match Stormlord in terms of depth, character and complexity. This is not an instant game, but a classic challenge. **PbM**

GREEN SCREEN
Loses some splendour.





● Look familar? Early sketches and finished game graphics show how a Cecco masterpiece gets put together.▲





● The seedier side of Stormlord. Spores the pity.

daisies - after being splattered by one their larger cousins.

Negotiation of an obstacle usually allows 'Stormy' to collect a magic item to help him on his search. Sometimes it's a key to open a cell door, other times it's an umbrella to keep off acid rain that kills on contact. He can only keep one item at any time, so it's worth taking a few minutes and losing a few lives to get to know which one to have in your pocket at what point. It's no use carrying a honey pot when you need a brolly, 'cause it just won't work matey.



To rescue each fairy requires not only the right icons and avoiding the traps but also, in typical *Cybernoid* fashion, a lot of monster blasting. Eggs fall from the sky and must be destroyed before they hatch and release a 'green jaw' creature with a real taste for 'lord's bones. While in others *R-Type* refugees don't take kindly to, well, anything. Worst of all though is the endless stream of pink fluffy worms who leap on you lemming style.

Stormlord gaming is made even more difficult by the tightness of the time limit. Should you survive to the end however, your reward is a breather, by way of a sub game. To win an extra life 'Stormy' must blow kisses at the fairies who, when hit, fall in love with their saviour immediately. Then the fairies burst into tears, ten of which have to be caught to stave off oblivion one more time on the next level.



● Every cloud has a dragon lining



● He keeps a knockin, but he can't get in!



● EGGsit Stormlord number 6.



● Somebody's stolen the floor!



The first thing that strikes you about the whole game is it's truly stunning appearance. *Stormlord's* colours are bright and vividly used to evoke a land of mystery and magic, while the sprite designs merge demonic and comic to create a unique character for the game. This sterling work by Nick Jones is accompanied by a brilliant soundtrack courtesy of Dave Rogers (whose work we featured in *AA44*). For a change these 'peripheral' details have had as much care lavished on them as the game.

Quality is apparent in every aspect of *Stormlord*. You won't have much opportunity to appreciate this while playing though. Not only do your reactions get a real workout, but the puzzles add greater depth that require the grey matter to be in gear as well .

This is no beginners game, but a challenge for veterans of many *Cybernoid* adventures, as Cecco has developed a test only the toughest, most committed will survive. *Stormlord* demands 100% concentration 200% of the time, and that's during the easy bits! TW

FIRST DAY TARGET SCORE
Reach level two

Cecco'd history or What's in a game?

There is one word that describes all Raffaele Cecco's work for the CPC and that's class. He's been on the cutting edge of games development since his excellent work on *Equinox* (*AA*10 83%). What's so special about his work, however, is not just the outrageously good graphics but the intensity of the gameplay.

Raf has developed a style of game where the boundaries of arcade and adventure overlap. Progress through a game relies as heavily on brainpower as that of fire power. The games demand you undergo a learning process to achieve success, but always accompanied by plenty of trigger pumping action to stop you getting blase.

In *Exolon* (*AA24* 93%), the game was won by collecting gadgets to enhance your chances. In the *Cybernoid's* (*AA*32 and 39 91% and 90%) there were more strap on's but this time more hazards to negotiate with split second timing. *Stormlord's* no different, only the setting has changed, and it will no doubt delight the many Cecco fans who've been resting up their trigger fingers in anticipation.

● Cecco classics.



The Verdict

GRAPHICS 96%
- The best looking game so far this year!
- A perfect blend of humour and horror.

SONICS 84%
- Imaginative and interesting score.
- Above average shoot'em up sound effects.

GRAB FACTOR 73%
- Nine lives make exploration easier...
- ...but not much.

STAYING POWER...85%
- Levels are so tough continued playing is a must, just to complete each level.
- Maybe levels are too tough!

AA RATING 92%
- Looks, sounds and is brilliant.

RENEGADE III

Imagine ● £9.95 cass, £14.95 disk joystick/keys

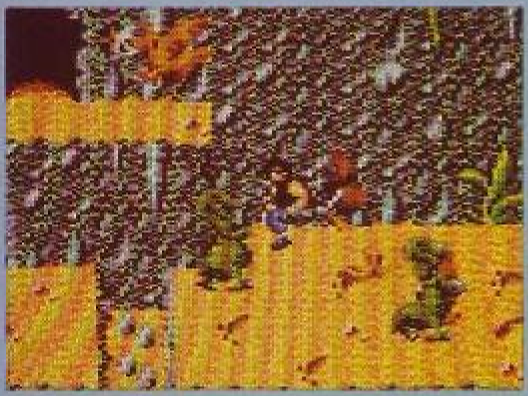
'Sniff. It's the last ever *Renegade*! The martial arts classic has entertained hundreds of thousands of people, and the quest climaxes with *Renegade III – The Final Chapter*.

There's little new in the story line. You must yet again rescue your girlfirend from the clutches of evil kidnappers. Grievous Bodily Harm is the not terribly subtle method of persuasion employed by the *Renegade*.

This time though, the captors are travellers from the future. You must travel through various times and places, defeating minions left, right and centre – it's a multiload game, by the way. There's also a time limit to beat, which is very tough on newcomers.

The game starts in the time when dinosaurs walked the earth. Two varieties here: big and little (design is not the game's strong point). Neanderthals also lope around, brandishing clubs which they're very eager to use if you get too close. There are ladders and platforms to climb on, and crevasses to avoid (by jumping – naturally).

In each level are two areas which cannot be walked through unless you defeat twelve opponents. They attack in two waves, so needless to say there's not much chance of coming out unscathed. After progressing to

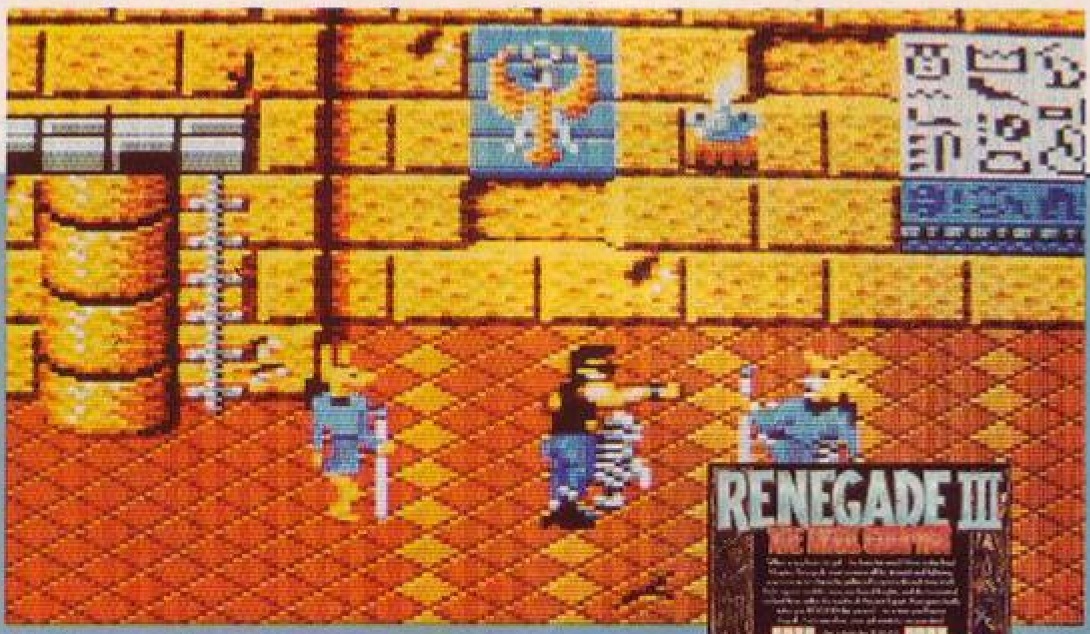


● The gaps are fatal

the final screen – and dispatching any remaining monsters – you are whisked forward to the following era. Speaking of time, any spare amount left on the clock is translated into bonus points.

Ancient Egypt is the next venue. Mummified birds and people are the main opposition here, with acid splashes and Anubis lookalikes adding some potent backup. Anubis is one of the Egyptian gods, and he certainly knows how to wield a walking stick to best effect.

If you can defeat the end of level guardians – and by this stage it's no easy task – then the medieval world awaits you. Here knights in shining armour chop at you with swords, and the occasional fire-breathing dragons are pretty hungry. I must admit that this was as far as I got, so exactly what comes next... The future, or perhaps a nostalgic trip to Manhattan first?



● Call yourself a Mummy!

Brothers in arms

The strangest fact about the *Renegade* trilogy is that it was launched just when the fad for karate style games was fading. The chance to take on street gangs, pick up extra weapons and occasionally mug a granny (not that we condone that sort of thing) was just too attractive for most people to miss.

Target Renegade was an improvement in some respects, in that the two player option added a new dimension (and made the game easier to play). The punch and kick variations were simplified, but if you got bored of them you could always just attack your friend.

Renegade III takes the cut down features of both games and adds vicious, difficult to beat opponents that somehow take the fun out of the game. It's a shameful way to end such a great game concept.

Graphically, the game is as pretty as it's predecessors, with the thug himself punching and moving in a mean, magnificent mood. It's a pity that the nasties, while well drawn, just don't animate so well. This naff aspect gradually deteriorates as you progress.

The scenario is silly and totally out of keeping with the previous *Renegade* games. That's the main problem with *Renegade III*. Imagine have taken the urban beat'emup and produced a storyline so out of this world that it's ordinary. (*Pardon? –ed*)



● Uh-oh, six enemies at once

SECOND OPINION

"I really like Target Renegade. I really hate Renegade III. He's not as mobile, doesn't fight as well and he's too fiddly to control. Nice music though."

TW

GREEN SCREEN
Very good

Gameplay is nearly the same as *Target Renegade*, except that there aren't so many different fighting moves. There's also no two player option, which is really annoying: and the opponents never give you a chance. The combat is just not as amusing as the games' predecessors.

To be fair, it's not that *Renegade III* is really awful: it's difficult but quite good. No, it's just that the previous two efforts are exceptionally amazing and have apparently proved beyond the capabilities of Imagine to improve on.

PbM

FIRST DAY TARGET SCORE
10,000 points

The Verdict

GRAPHICS 81%
□ Very colourful.
■ Ropey animation sometimes.

SONICS 84%
□ Nice Tune.
□ Good Jingles and effects too.

GRAB FACTOR 52%
■ Far too difficult.
■ Lacks variation.

STAYING POWER .. 70%
□ A lot of skill needed.
■ Maybe too much?

AA RATING 73%

□ A good game...
■ But not up to scratch.

NAVY MOVES

Dinamic● £9.95cass, £14.95disk joystick/keys

The waves are pounding your dinghy, the sea spray lashes your face, the cold is numbing but you've got a job to do. An enemy super-sub has been sighted off the coast and it must be either captured or destroyed. The mission is highly sensitive , so you go in alone with no prospect of rescue if caught. Are you ready? You were born ready (as they say in the movies).

The first real problem is finding the sub. Now as always in the world of cloak and dagger life is never straightforward, and you haveto negoitiate a route strewn with mines - so many in fact it makes the straits of Hormuz look like a secure sea lane. At a conservative estimate there's at least one mine every five meters, which is a lot of explosive for a little water.

Undaunted, you rev up the dinghy and speed off into the night. To get past the mines you need to get your rubber raft to bounce off a wave into the air. Simple, apart from the fact that the next boat busting bomb is just over a dinghy length behind it. You have to encourage your raft to skip between them, sometimes wrenching your joystick forwards and backwards to leap grouped mines or fit into a very tight gap.

Failure to achieve this nigh on impossible task results in an explosion which pitches your diver into the drink - probably the safest place to be. As if by magic though, you are whisked back to the beginning (very distressing) to try with another of your eight lives. If this diver was so good why can't he swim all the way and cut out this thankless task altogether?



● It's simple all I have to do is leap ....

The action is immensely intensive, highly reminiscent of the opening bridge section of *Army Moves (AA22* 58%), and every bit as infuriating.



● ...over these MINES!!!

The style of the whole event though is great fun. Your old sea dog gets blown out of his boat with truly balletic grace into the brilliantly drawn briny blue. He even manages a back flip before disappearing into the ocean with a splash. You may not succeed immediately but who cares you're too busy looking good.

After a similar set of trials and tribulations to his land locked army chum, the marine hero eventually reaches the safety (!) of the the enemy sub. Here things ease up a bit on the fatality front. Your jolly jacktar is tooled up with a machine gun/flame thrower and is hunting for the four officers who control the the submersible. Around he runs using lifts and doors to move about the ship, always on the look out enemy soldiers who must be avoided or shot on sight.

SECOND OPINION

"It's not quite as evil as Army Moves, but it's a close run thing. A tough game with great graphics, especially in Part Two." PbM

GREEN SCREEN

visibility zero (Part One)
visibilty good (Part Two)

He runs, crouches to shoot and lies on the floor to duck shots and hide (these guards have really bad eyesight, they just walk right over the top of him). In gun battles your victims are hurled cinema style backwards with the impact of bullets, or fall to the floor crispy at the edges if toasted with the flame thrower. When dead they have the decency to hang around for a couple of seconds to allow a brief bit of looting for ammunition, first aid or if it's an officer, code numbers. These are your primary objective as they allow you operate the subs computer controls. Of course if you torched your opponent then there ain't much left to search. Bullets don't keep well at gas mark 9.

The running around is astoundingly more survivable than the dinghy in Part One. The sub is complex enough for you to spend many happy hours just blasting anyone unlucky enough to come your way and rummaging through his pockets for more supplies. The computer section means that once you've collected the codes and fed them in with the correct commands e.g. Stop engines, the sub surfaces and then ...well that would be telling.

Dinamics have turned up another graphically sound game that is just too difficult to play. Games should have their more difficult sections later and not sooner, if the player, regardless of experience, is to enjoy it to the full - if only to give you an idea of what's going on. No doubt those who eventually whipped *Game Over I ,II* and *Army Moves* will relish the prospect of another such challenge. The rest of us who actually like to see more than 10 seconds of action before dying, will have to wait for the passwords to avoid section one.

TW



● He really should stop smoking!



● Sub human behaviour

FIRST DAY TARGET SCORE
3,000 points

The Verdict

GRAPHICS 84%
- ☐ Dynamic action.
- ☐ Realistic battling on a giant sub.

SONICS 64%
- ☐ Great spot effects create atmosphere.
- ☐ Good tune, if rather short.

GRAB FACTOR 32%
- ■ Far too difficult in the opening stage.
- ■ Impossible opener on a green screen.

STAYING POWER...71%
- ☐ Part Two adds a whole new depth to the gaming.
- ■ That's if you can ever get to Part Two.

AA RATING 67%

- ☐ Dinamics strike again with a great game...
- ■ ... spoilt by overly difficult gameplay.

TOTAL ECLIPSE 2 SPHINX JINX

Incentive ● £11.20 disk, joystick/keys

'Although a subtler sphinx renew, riddles of death Thebes never knew' (P.B. Shelley). Well Thebes may not have solved the riddles of death, but you'll to have to if you want to survive the *Sphinx Jinx*. Just when you thought it was safe to get back out of the water and venture once more into the desert a new task has been set.

Having saved the world from calamity in *Total Eclipse* you are now presented with news that the twelve parts of that dogs body (*lion, actually - ed*) the Ancient Sphinx, are to magically disappear for eternity if the statue is not re-assembled within one hour. You know what this means, it's sandy boots time again! So dust off that hat, oil your bull whip and go pyra'mad.

It's very much as you were on the Incentive ranch, and the game begins with you wandering aimlessly around outside three pyramids . Immediately *Eclipse* flashbacks occur, and remembering the back door, you may decide a good reccy is in order. Again though those fiendish Egyptians are one step ahead, because as one of the buildings is rounded you see something shimmering in the sand. Over you charge, deliriously happy, having finally gotten to know how the Freescape mind works. When before your very eyes the apparent pile of gold bars dissappears, as you are told 'mirage'. As you try to get your ego back into working order it's time to go into the pyramid and find some real gold.

The gameplay is identical to *Eclipse*, but the theme is somewhat different. Instead of finding one route to a specific point, you now have to discover the whereabouts of the twelve statue fragments. To achieve success you now have to learn a route that allows you to pick up each piece within five minutes, which doesn't allow much room for error. This has to be done as well as collecting ankhs, gold and water.

The traps and tricks too are subtly different: this time they are more obvious in guise but more devious in solution. Invisible walls block your path, walkways are obstructed by hovering blocks and half walls trip you, spilling life saving water. More fiendish pitfalls await you though as you venture further into the perilous pyramid. Hovering floors appear and disappear and must be negotiated a block at a time. This is not as simple as it sounds because they vanish in a pre-arranged order which must be figured out (as well as the minor problem of walking on the blocks themselves).

Other areas have portals which whisk you to different rooms and mouths that have to be climbed through whilst open - he who hesitates is not only lost but munched. Like *Eclipse* (with it's *Illusion* sector) there is a *Jinx* zone which costs you an ankh to get into and tears of frustration to leave.

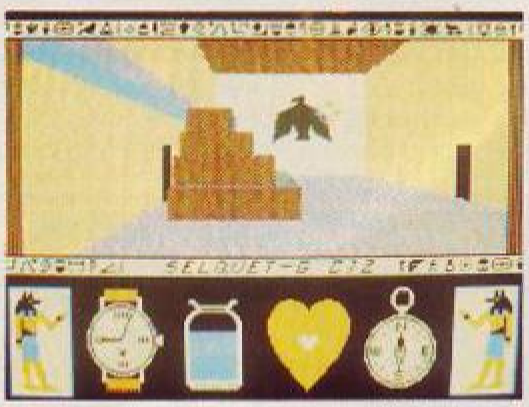
Sphinx Jinx is set in a slightly smaller tomb than *Eclipse*, but there are more intensive trap sessions along the way. Mapping is made simpler because of the lesser number of levels, but progress is hindered by tougher rooms. Freescape may not be as revolutionary as it was back in the days of *Driller*, but now it's more complex than ever before. If you've not got *Eclipse* and are already a member of the Home Computer Club this game is one of the greatest bargains going. **TW**

Incentive enough?

Total Eclipse II - Sphinx Jinx is only currently available through the Home Computer Club, in a special bargain pack with *Total Eclipse*. Is this good news or bad? For members of the H.C.C. who want to try their hand at Freescape it's an opportunity not to be missed.

But for every one else it may not be such great value. If you already own *Eclipse* is it worth buying the same game again? Well, if you enjoyed and eventually solved part one' then the answer is probably yes - but only for total Freescape fanatics. If you have *Eclipse* and are not a member of the H.C.C. then this is probably not the greatest ever deal.

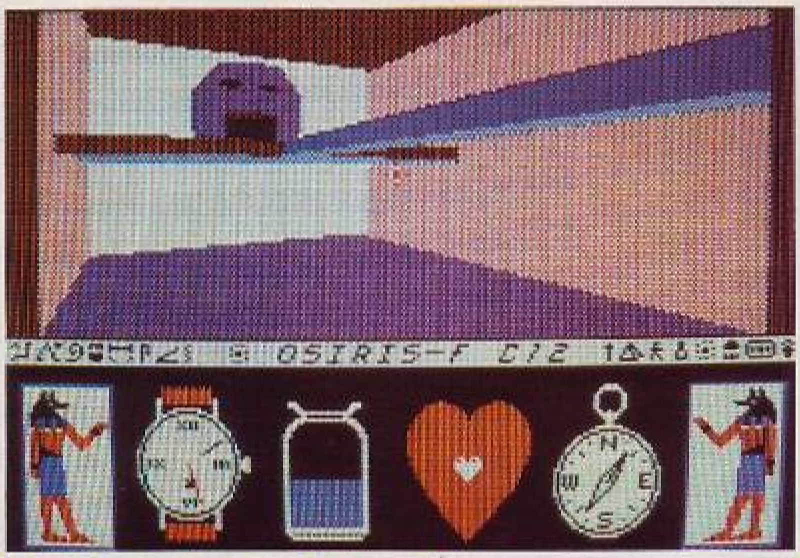
As a recruiting drive the H.C.C. could not have chosen a better game, for the Incentive boys always manage to turn out highly interesting and massively popular products. Let's hope that in the months to come *Sphinx Jinx* will be available generally as an individual game, so once again we can all go adventuring in the desert once more.



● Eagle eyes spots a hidden door



● Never, ever, trust a door guarded by rabbits



● You want me to crawl through where?

SECOND OPINION

"Freescape games are definitely a hit with me. Ok, so it looks very similar to Total Eclipse. *But* Sphinx Jinx' *puzzles are even better!"*

SC

GREEN SCREEN

fine if you can stand green sand

The Verdict

GRAPHICS 89%
- Freescape strikes again
- Smoothest 'scape game yet.

SONICS 43%
- Serviceable sound effects.

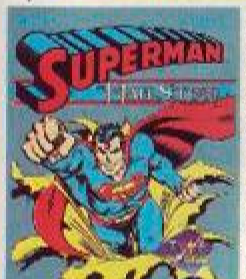
GRAB FACTOR 78%
- The first pieces are pretty conspicuous.

STAYING POWER ... 83%
- Massive mausoleum maze.
- Enough enigmas and deathtraps to keep you engrossed for weeks.

AA RATING 81%
- Classic Freescape conundrums.
- Shame it's not available in the shops.

SUPERMAN

Tynesoft ● £9.95 cass, £14.95 disk joystick/keys



The ultimate superhero has finally made it out of that telephone booth and on to the CPC. Now the Man of Steel is ready to settle old scores with that villain to beat all villains, Lex Luthor and his evil Lexcorp. Bedecked in Red and Blue, the righter of wrongs and the protector of the weak has to complete six dangerous tasks to save the world. Can it be done? Pull those undies on outside your trousers and go up, up and away as Superman to find out.

You join the action at key points in a comic book storyline: first off you must defeat Darkseids Parademons who try to intercept you on the way to Metropolis. In true Supes fashion these can be despatched with a blast from his heat vision or a solid punch. Even in the world of super powers, the old adage seems to hold true: if nothing else works, thump it!

The adventures continue in the same fashion, with Supes having to smash his way through a couple of asteroid showers liberally laced with kryptonite and death dealing robots, break into a couple of space stations (vandal!) as well as defeat the forces of Lexcorp.

The stages are all variations of coin'op style games but with the man himself as the high powered agent of destruction. Level one is *Afterburner* with a cape; two, *Blasteroids* meets *Space Invaders*; while the games inside the satellite stations are identical to (*add horizontal scrolling shoot'emup of your choice - ed*)

Is it a bird? Is it a plane? On level one it's actually hard to tell. *Superman* is seen from behind and only when he's climbing or diving is he distinguisable as his mighty self. The rest of the time he's no more than a red and blue kryptonian blob. In short the graphics are passable even if Supes never does move faster than a dud bullet, never mind a speeding one.

The whole package is essentially six individual games bound together by a rather tenuous super story. As a compendium it's good fun although tape users beware, it takes forever to multiload - with some games (the asteroids) better than others. Fortunately there is a built in cheat feature which allows you to skip to the game you want, rather than having to wade through Parademons until you're blue in the face.

An annoying factor is the overly sensitive icon control for the superpowers (flight, kicking, punching, super breath and laser vision). Not only are they easily destroyed e.g. one hit from a concussion cannon and it's finito, but they are also rather fiddly to manipulate in the heat of battle. Superman had all these talents all the time, so why is his computer cousin underpowered?

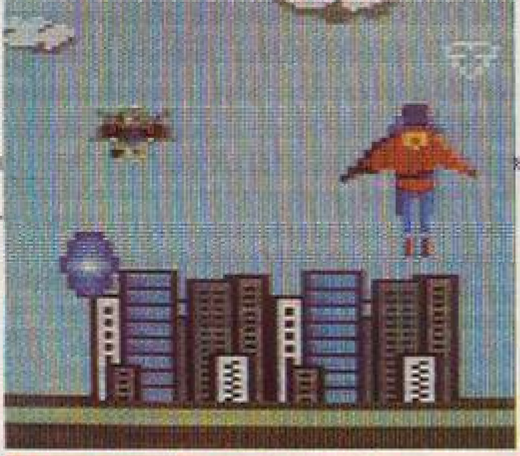
A great game for fans of the Man of Steel, but lacking in enough continuity and depth to satisfy other games players for long. Still the boy's a long way from home so we should make the ultimate illegal alien feel at home. Besides, who's capable of telling him to clear off? TW

FIRST DAY TARGET SCORE
7,500

SECOND OPINION

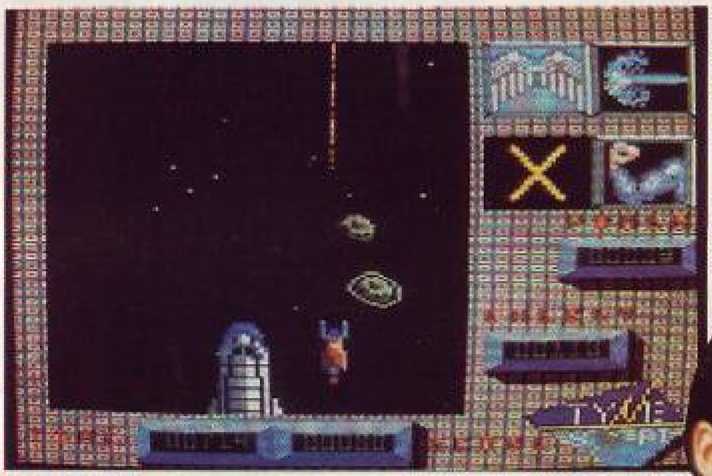
"The first caped crusader is here and I must say I'm disappointed. It lacks speed and tension, and there's too much combat . Supes saves the world by using his brain and not his bicep power, but here he's little more than a krypton powered Super thug! " SC

GREEN SCREEN
tolerable

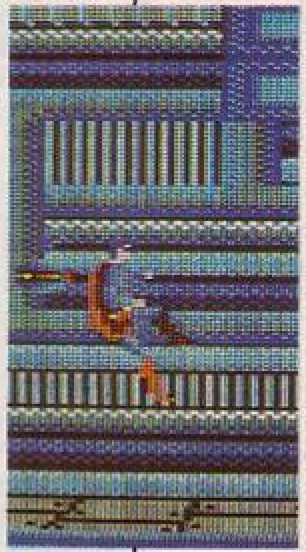


● Leaps whole cities in a single bound!





● Which of his super powers would you vote for?



Superfax

1=Superman's home address is flat 3d, 344 Clinton Street, Metropolis.
2=There are seven kinds of Kryptonite.
3=Krypton is approximately 1.8 trillion miles from Earth.
4=Superman currently works for WGBS TV in Metropolis.
5=His niece (Kara) is Super girl.
6=As Superman, Kal-El is 6'2", as Clark Kent he's 5' 11"!
7=He had a Super dog called Krypto.
8=Supergirl had a Super horse called Comet and a Super cat called Streaky.
9=Superman once had a rocket plane made out of Superanium.
10=Superman's powers include the ability to change his facial appearance, speak all languages and solve maths problems faster than a CPC!



● Top - Christopher Reeve, the worlds latest Man of Steel, star of four 'Super movies' Middle - George Reeves (no relation) star of the kryptonians earlier adventures on TV. Bottom - Kirk Alyn the worlds first Supes , star of two cliffhanger serials in the late 40's.

The Verdict

GRAPHICS **64%**
☐ Clear but small sprites.
■ Slow movers.

SONICS **51%**
☐ Use your your Super hearing and ...
■ ...you'll still be disappointed.

GRAB FACTOR **69%**
☐ An instant hit with Supes fans.
■ A miss with with everyone else?

STAYING POWER **61%**
☐ It may take mere mortals some time.
■ A bit repetitive.

AA RATING **63%**

☐ If not Super then at least Above averageman.

FORGOTTEN WORLDS

Capcom ● £9.99 cass, £14.99 disk joystick/keys



● What's green and carries a laser cannon? A liz'ard



● Why am I wearing sunglasses at Night?

AA RAVE! RAVE!

It's dark, you're wearing sunglasses, you've a rifle full of ammo, a jet pack full of gas and a real bad attitude. Lock and load because it's time to rock and roll. There's only so much a man can take, even from a War God. They've made you mad, so it's clobberin' time.

You're visiting your old home town, once a proud metropolis, now a smouldering ruin. There you find them, the self same lizard warriors who trashed the place, way back when. You're mean, you're lean and they're green. You start to rumble and have to learn how to handle your jet pack and blaster cannon. Manoeuvres are tricky but you get the hang of it real quick.

Now an odd thing occurs when you blow them to pieces: as well as lizard meat, you see coins. If you're quick you can dive in and catch them before they hit the ground, (earning a living as a homicidal maniac isn't easy) as every penny will be helpful later on. The more battles you get into the more coins you find; not only on dead opponents, but hidden away in the ceiling and other nooks and crannies.

The fire fights continue as you scroll along, meeting an ever increasing number of enemies. Then out of the corner of your eye, what do you see? A shop (yup, Tescos get everywhere - even the *Forgotten Worlds* war zone). Naturally curious you pop in. On sale are all kinds of goodies to spruce up your kill ratio: extra lives, more firepower, even a newspaper giving you hints on how to top the end of level God.

All these goodies are useful, but the most valuable by far is the info in the papers. It's recommended that each time you reach the shops on a new level you have a read and note down the information. It sounds like a Sunday Sport exclusive 'How to kill your God!', but knowing whether to hit the head or the heart can save you time, and lives.

Each of the *Forgotten Worlds* is dominated by a Deity of Destruction. These boys are big, bad and impressive, in an ugly sort of way. Each has a specific weakness (except for Byos, main man of the final level) but this is hard to find and even harder to exploit. They are gods after all and as such should be given every respect - and as many bullets as you can pump with your trigger finger.

Every level has it's own character and special hazards (apart from being shot at). Level One features pods that drop from the ceiling when hit, an unavoidable occurrence for firepower freaks who've purchased eight way cannons. Level Two, the water world, has a nice line in giant worms that hide below the surface and pounce when you're least expecting it. Luckily they always stay in the same place, so learn where they are and when they strike. *World Three* features another city, which for part of the time scrolls diagonally, to keep you on your toes. Level Four is the killer, here one of the more mild obstacles are the snakes, like their sea-faring cousins they burst out of the ground and spit at you. Serpently something to be avoided at all costs

The game is blessed with the essential ingredient for all classic shoot'em ups, speed. The pace, allied with the vast firepower on offer mean things get pretty hot, even on the Ice World. The sprites and backgrounds suffer slightly for this, but it's a worthy sacrifice. There are still moments of graphic glory though, just look at the Dragon that guards Level Two and you'll see.

This is a full blooded arcade conversion and total anarchy is the result. Monsters scream in at you guns blazing, creatures try to eat, burn and otherwise dismember you in every conceivable way. In return you can let rip (especially in two player mode) with an awesome arsenal of your own. Brain power may not be required, but with so much on screen action, there wouldn't be time for it anyway. Keep your barrel cool, your powder dry, and don't fire 'till you the see the whites of their eyes: if they've got eyes that is! **TW**

FIRST DAY TARGET SCORE
10,000 points

SECOND OPINION

"You play one game of this and you think "Side Arms'.To be fair there's better gaphics and improved play, but it's still not terribly engrossing. Vetereans of the arcades will love it."" PbM

GREEN SCREEN looks fine



● A classic shop'em up!



● My what big teeth you have Grandma!

The Verdict

GRAPHICS **83%**
- ☐ Great gods of war!
- ■ Small but speedy sprites.

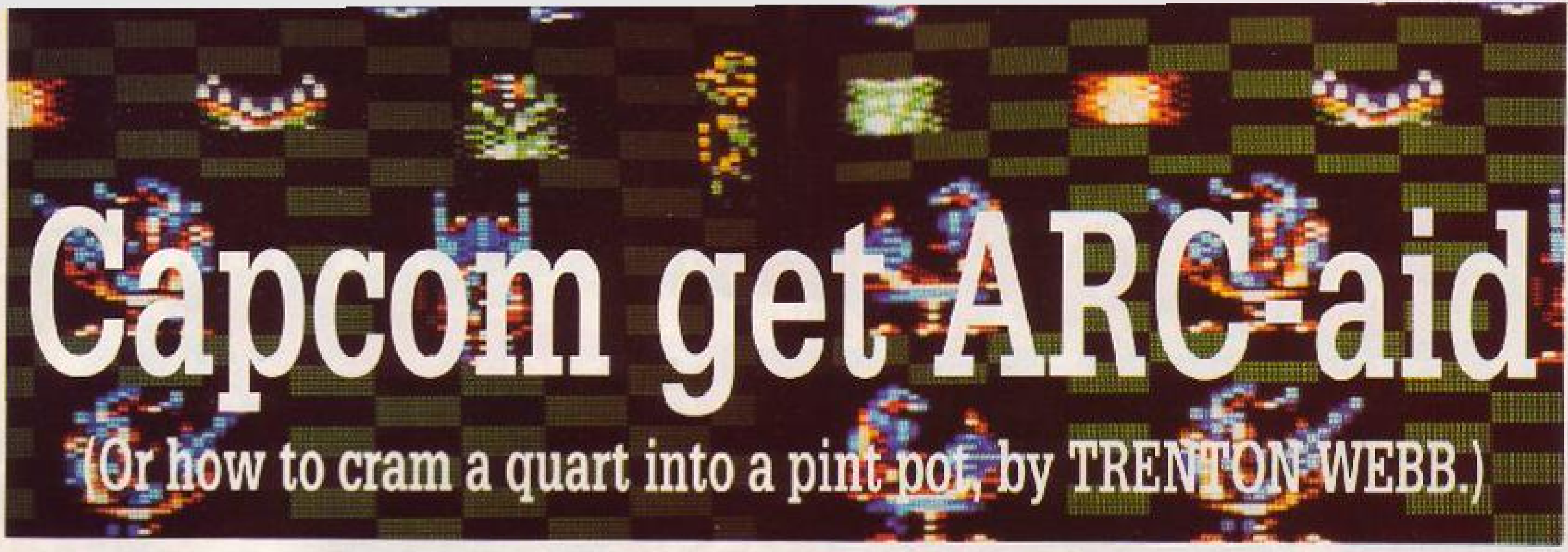
SONICS **68%**
- ■ Standard shooting gallery sounds.

GRAB FACTOR **79%**
- ☐ Easyish opening section.
- ☐ Gets well 'ard later on

STAYING POWER ... **77%**
- ■ Only four levels...
- ☐ ...but they're bursting with nasties!

AA RATING 80%

- ☐ Great coin'op action.



Capcom get ARC-aid

(Or how to cram a quart into a pint pot, by TRENTON WEBB.)

How do programmers actually shoehorn the vast memory capacities of Arcade machines into home computers? ARC Developments have been pondering the self same problem these past four months, while trying to convert *Forgotten Worlds* for the CPC. We went to Walsall to talk to them about the blueprint for a game.

Byron Nillson: 'At the outset, US Gold gave us the coin-op, and we decided that's all we wanted The source code wouldn't be of much use and to take the graphics straight from the arcade would limit our artistic licence. We wanted graphics that were individually tailored to suit each machine.'

Workers playtime

'We played the coin 'op, a lot, to get to know the levels and gameplay. Initially, we had a video of the first three worlds so it was decided to use these as our starting point. Then towards the end of the project we agreed that we would do a fourth and final level with Byos (the main war god) at the end of it.'

The arcade was only used for inspiration and artwork design purposes. Arc wanted to produce a game that exploited each machines' strengths, to create an exceptional game for every format - not an average game for all, as is so often the case.

'We've tried to make the first three levels progressively harder, a feature of the arcade. It's got to be reasonably easy to start with, so people can get into the game. You need increasing difficulty though, because with the improving weaponry, it would soon become boring if the danger level remained constant. Still, at the moment on the two player game we'd like to toughen it up even more'.

'In three months we got the game going, and it was then a matter of tidying up and adding the finishing touches. At this stage though you find you've run out of memory, and have to start trimming and crunching, just to cram the extras you want into the game. We see the finishing period as being, not only the most time consuming, but also as the most important if the end product is to live up to our expectations'.'



●'The amount of animation in the dragon really grabbed us, and we've tried on all the different machines to put that in'.

Games, graphics and gods

'There's the game, there's the graphics and the end of level god. The game is loaded at the beginning, the graphics are loaded for each level: the code to run the end god is also loaded separately because he's so substantial you could never fit it all in. So new sets of code are loaded for running the gods, because of the way they scroll on screen and the amount of animation.'

With all these considerations it's not surprising that the programming takes a long time, and now five months since the start of the project all is finished. This deadline was only met by the Arc team regularly working 10 hours a day with weekends thrown in for good measure. Has all their hard work been worth while? There's only one way to find out...

Graphic details

Paul Walker, Graphics

'First of all I sit down in front of the arcade, from there I'll do the Amiga graphics. I then use these as the basis for all the other machines , to keep continuity between formats. Then I produce the graphics for the CPC on the Amiga, in the correct format, 16 colours, double pixels and the right palette. From there transfer them down onto the Amstrad via a PC.'



●The ARC team Left-Right = Byron Nilsson (Z80), Paul Walker (artist), Warren McCormack (PC), Chris Coupe (Amiga) and Tim Round (ST).



●Raw graphics, as used by ARC development: a work screen, as used to design the shops, cogs and a gun turret or two.

Amstrad Artiste

Byron Nilsson, Z80 specialist

'The Amstrad has the advantage of much better graphics than the Spectrum, although most of the code is the same. Essentially moving a lizard is moving a lizard, on either machine. For it's higher picture quality the CPC pays the price of being slightly slower. I'm hoping to keep the game at exactly the same speed as the other formats. Speed is the soul of a shoot'em up and that is what I'm aiming for.'

'Working with bit sprites helped. If I had to diagonally scroll the background it would have been hell. All I have to do now is move my sprites at a diagonal instead of horizontal. The system I've developed for the Amstrad means I can now use diagonals and verticals, well any way I choose. A lot of thought went into creating these routines just to get as close as possible to the coin-op'.

The backgrounds on the arcade are just tremendous, you want to play just to see the next set of graphics. But it was the end gods that really quite shocked me when I first saw the coin-op. This is what's special about our version: the end of level monsters are bigger than I've ever seen on any games. I mean we've a four screen high god! And with each god being totally different it's like a separate game at the end of every level'.

Compumart

A Great Deal More For a Good Deal Less!

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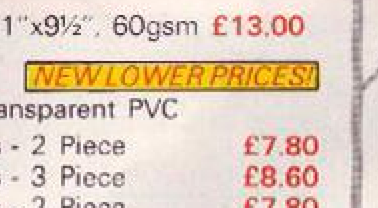
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TANK ATTACK

CDS● £12.99 cass, £14.99 disk
joystick/keys/kitchen table



The battle of the Somme, September 1916- A new age for the arts of war, the day of the tank has dawned. In 73 years things have changed a bit, no more bath tubs with pop guns, now they're hunks of metal with shells big enough to scare holes in the enemy. The great tank commanders are legends: Rommel, Patton and Zhukov all combined stealth, tactics and extreme violence in perfect balance. Are you the stuff of such myth or just so much scrap metal?

Tank Attack places you in a land of four countries, who share common borders, but are eternally at varying stages of war and alliance (sounds a bit like the E.E.C.!). The nation states of Armania and Kazaldis are long time buddies with a pathological hatred of neighbouring Sarapan and Calderon. True to form the gutter press have been stirring it up something rotten and jingoism is rife. The people want war, the papers demand it and the politicians are rattling as many sabres as they can lay their grubby hands on. You are the Supreme Military Commander so it's time to earn your pay. Wind up those war wagons and wage world war.

> **SECOND OPINION**
>
> *"Risk it ain't, but playable it is. As games go it's no classic in either it's board game or CPC guise, but as a hybrid it works well. Let's hope this is the start of a new wave of tradition-al/computer game crossovers."* **SC**
>
> **GREEN SCREEN**
> *Absolutely no problem*

The lay of the land, towns, bases and other trivial sites such as H.Q.'s are all marked out the game board. As war looms you can mass your forces on the borders to attack or around cities for defence. You've only a very limited amount of armour (four armoured car and eight tank units) so the initial deployment of your forces is critical. When all your bits are on the board then it's wartime.



This is where (at long last) the CPC puts a spanner in the works. The computer has the role of generating all the random factors of the game in the form of War News, the daily paper, moves allowed and combat. The press report how battles have gone, although they are economic with the truth at times. More importantly they give the weather report which holds vital hints about the advisability



● Hi ho, hi ho, it's off to war we go

of launching an attack. Rain it appears stops not only play, but also wars.

The amount of moves you can make are also dependent on the climatic conditions, and so when it's sunny you can take the tank out for a pretty long spin. When wet the battlefield becomes a muddy hell. The same parameters (as well as the element of luck) guide the combat with regards visibility.

Duels between tanks it must be said though are not really edge of the seat material - the realism gets in the way. Tanks are naturally able to destroy their foes easily but, as is often the case, when spotted it means you're a sitting duck too. The likelihood of success in any duel is based around the range (1-4 squares), the rating of the vehicle (light armoured car to main battle tank) and good fortune. It is possible to get lucky and trash a much more powerful opponent but this is a high risk strategy which generally results with a shell landing in your lap.

Tanks can be repaired when they've been hit, but you only have a limited amount of overhaul and rebuilding facilities at your disposal, so tactics again become important. If you have no rebuilding facilities available it's time to ditch that vehicle altogether, so cautious use of both heavy tanks and servicing points becomes crucial to the game.



Having noticed the ease with which one of your shiny new Shermans gets destroyed, you'll begin to realise that the game is actually mis-named. Tank Attack should really be known as *Tanks staying out of trouble until they really have to fight-and then only begrudgingly Simulator*. This is not to the games disadvantage as the strategy suits the board game aspect, and takes away the opportunity just to charge, hell for leather, to the enemy H.Q., level it and win the game.



A few more prudent days could have been spent tidying up those grey areas that perpetually dog boardgames: the initial placing of tanks for example is a very vague process. The computer side too could use some extra embel ishments such as sound effects to underline the fact that it is not an aggrandized dice but an integral part of the games random structure. Still devotees of strategy games will have a great time trying to

wipe out friends and relatives, with a game that not only forces you to interact with your CPC but gives you a chance to express evil thoughts and deeds to people's faces! **TW**

FIRST DAY TARGET SCORE
Win



● Don't head for the hills, shell 'em

The Verdict

GRAPHICS **58%**
□ Informative screens.
■ Limited by the nature of the game.

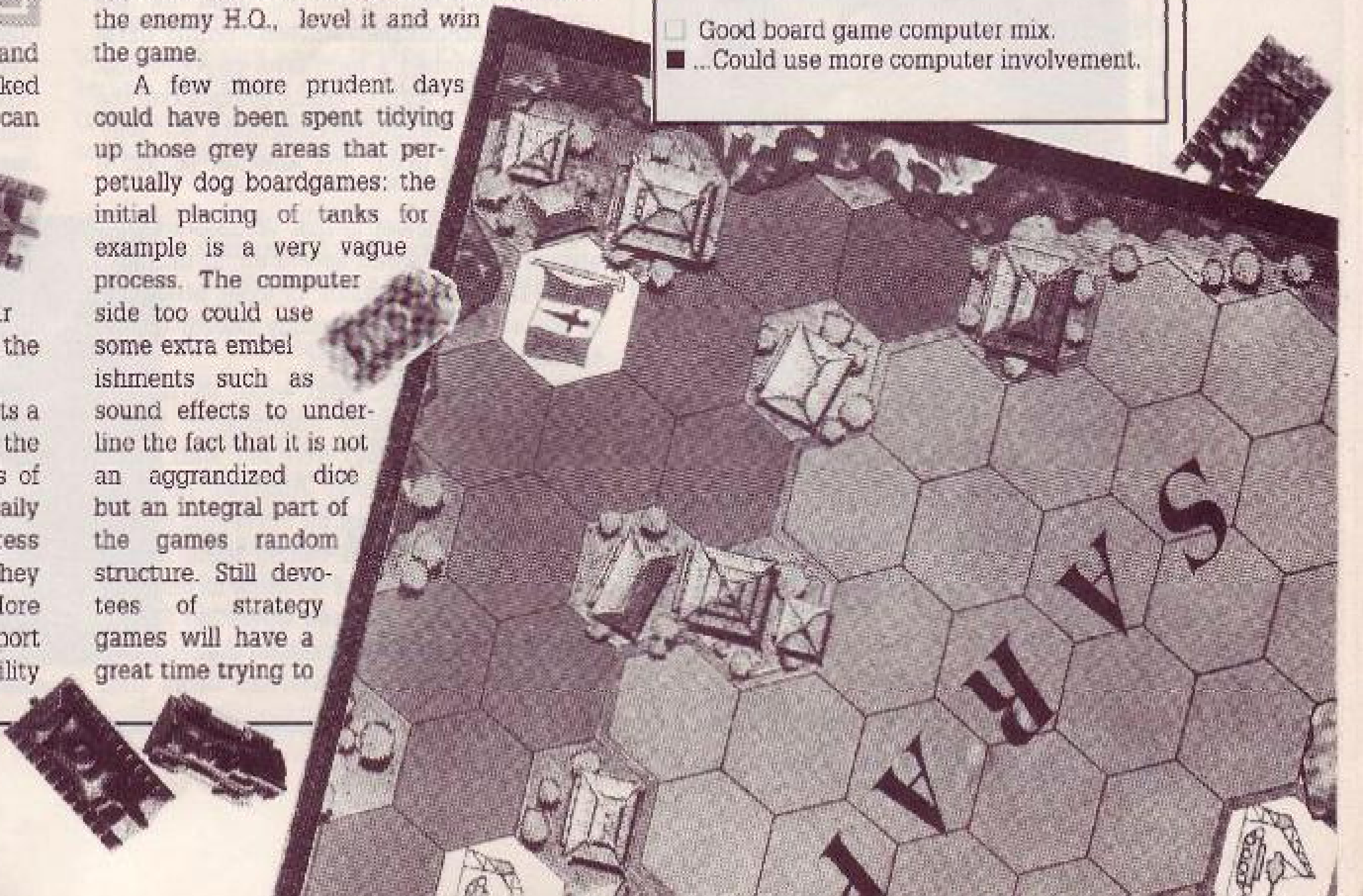
SONICS **00%**
■ What sonics?

GRAB FACTOR **61%**
□ If you like board games great fun.
■ If you hate board games forget it.

STAYING POWER ... **69%**
□ Indefinite - as each game is always different.
■ Needs two interested players at least, but four are better.

AA RATING **67%**

□ Good board game computer mix.
■ ...Could use more computer involvement.



A different world...

There's a whole range of serious CP/M software out there that may be just what you always wanted, as STEVE PATIENT reveals.

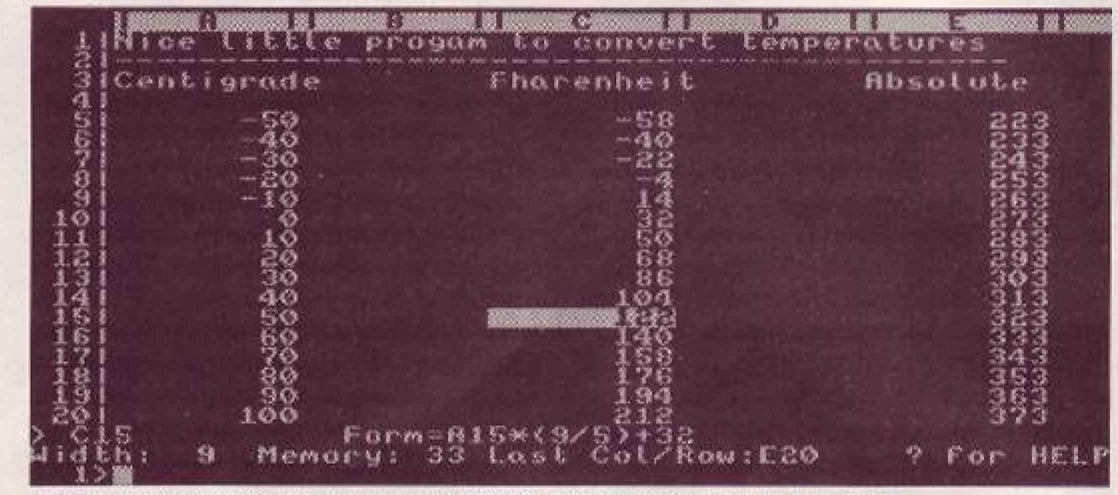
The CPC operating system (OS from now on) is a program that lives in the machine permanently and is designed to handle all the difficult things like telling the screen what to do and getting information onto and off of tape. But *Amsdos* isn't the only one, of course, for there's also CP/M.

Home micros often have their own unique OSs, usually showing a Basic command line to the user, and the CPCs are no different. There are two reasons for this. The first is that it looks friendlier and the second (and probably more important) reason is because it's cheaper for the manufacturer.

But while home machines were convincing everyone that Basic was the normal thing to find when you switch on a computer there were far more powerful OSs out in the world where the big money lives, in business.

Unlike those on the home computers these professional OSs were found across a wide range of computers. The most widespread of all in the years from 1974 until the early 1980s was CP/M. At one time most of the personal computers in the business world were operating under CP/M, and it looked as if it might go on forever (of course, in the computer world forever is until next Wednesday). In fact CP/M held sway until IBM chose a different system for their own personal computer launched in 1981.

Learning to use the CP/M command line OS and the character-based programs that run under it is one way of coming to terms with the wider world of business computing. In most offices it's all like that.



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dBase II ● Ashton Tate
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These and many other CP/M programs, including such up to date CP/M goodies as the database *AtLast Plus*, are available from a variety of suppliers.

See *Buyers Guide* for more details of this and other programs.

Got those CP/M greens

Because CP/M ran on so many machines in so many businesses plenty of professional quality programs were written for it. Several of the big name programs in the PC world started out as CP/M programs. These include such names as *dBase II*, *SuperCalc* and *WordStar*. Budding and would-be programmers should note, incidentally, that if you want to have your program become famous you need to spool badly and have no idEa wHere to put the capital letter.

Because these programs all used the OS to get at the hardware on the machine, and because the OS on all the machines was CP/M, all these programs, and many others, would run on a variety of business computers with few if any modifications. The main result of this was to produce a lot of sales, enormous profits, and hence a great deal of competition.

This competition proved good for the products and business software on the CP/M machines reached a high level of sophistication compared with products available on the then current mainframe computers. But why, if CP/M is so good, are Amstrad selling it cheap?

Well, the answer is that Wednesday duly arrived and the world moved on, in this case to MS-DOS (or 'Domestos' or even 'Messydos' as it's sometimes irreverently called) on the famous IBM contemptibles.

Digital Research, who wrote CP/M (and were originally called Intergalactic Digital Research – yes, really) were left with an OS that was *passé*, darling. Amstrad, however, who weren't in the least bit interested in fashion (and if you tried calling them darling you'd probably have got a smack in the gob), promptly bought one used Operating System going cheap, millions of careless owners.

All the companies that had taken their CP/M software into the back garden and buried it, now rushed back out to dig it up again and sell it a second time. But now, instead of it costing six months' wages to buy a copy of *WordStar*, for example, you could earn the money to buy it doing a freelance article for *Amstrad Action*..

All right, so you can buy both CP/M for the CPC machines and software to run under CP/M. But what can it offer that makes it worth forsaking the brightly coloured lights of high speed, mode 1, shoot-em-ups?

Wrodrats

In case you've read this far (have you really nothing better to do?) CP/M stands for Control Program and Monitor. The most important thing that it controls is the floppy disk system. It was easy access to floppy disks that gave programs running on CP/M computers so much power, and the programs certainly took advantage of it.

One of the hallmarks of older style CP/M programs is a great deal of disk stirring. In order to fit in all the features required of a business application programmers resorted to overlays held on disk, a process taken to laughable extremes by *WordStar*, which required a disk access every time it displayed a message – one of the messages *Wordstar* likes to display is 'Please wait', which it does a lot.

In fact *WordStar* is actually very pleasant to use (despite my carping) though it lacks the speed of modern, machine dedicated, word processors. People paid a lot of money for it and they expected it to do anything they might want, and it does, but a bit on the slow side. Control over the printer is near total and it can be configured to drive any dot matrix or daisywheel.

Creating highly structured documents is straightforward using a combination of ruler lines, the infamous (but straightforward) dot commands, and embedded printer control

Fishing for cheaps

No discussion of CP/M would be complete without mention of the public domain libraries. There is more PD software for CP/M than for any other OS apart from MSDOS.

Around 10,000 programs are available and many of them are even usable. Some of the very best utilities are PD including the famous NSWEEP. My favourite editor is PD software (complete with *WordStar* commands) and I use an assembler and monitor from the same source.

The very best CP/M library is that of the CP/M User Group. For more information send an SAE to Diana Fordered, CP/M User Group (UK), 72 Mill Lane, Hawley, Dartford, Kent, DA2 7RZ – but don't expect to get your hand held, she bites.

commands. A nice feature is that *Wordstar* keeps track of exactly what is text and what isn't. It won't put the cursor on an embedded printer command or the page break line and continues to show line and page breaks correctly no matter what else is on the screen.

Working in *WordStar* feels very solid: it nails every character down firmly and always gives the impression of being in control.

Cell by data

The very first computer based spreadsheet was *VisiCalc* on the Apple computer, and helped launch that company into the big time. But in the CP/M world it was *SuperCalc* that carried the day.

A spreadsheet is literally a large sheet of paper on which accountants used to do calculations. Working on a budget for a project they would put in all the material costs, wages, storage charges, estimated profit margins, sale price, unit sales, interest charges, expenses, bribes and anything else they could think of and see if the numbers left them rich or bankrupt. (They kept rubbing out the figures until they were rich. I mean, when did an accountant last mug you for the price of a cuppa tea?)

An electronic spreadsheet allowed them to do the work of days in minutes: considering how much accountants charge and how boring spreadsheets are, this was popular all round. *SuperCalc* set the standards for modern spreadsheets, and in its latest incarnation (*Supercalc 4* on the PC) is still making big profits for the Sorcim company. In practise it's hard to think of a practical use for a spreadsheet in the home but they're such fun to play with that I don't see why a reason is needed. So I won't give one.



● *WordStar*, still going strong despite the criticisms

Calculated risk

Spreadsheets are only one part of an accountant's life, but it isn't all that exciting: there are the actual accounts to be kept.

Camsoft were early contenders in the CP/M accounting software stakes, and their modular packages still sell well now. A lot of people who bought CPC machines as upmarket toys were surprised to find they could actually get serious work out of them.

An accounting package can save a small businessman hundreds of hours a year, hours he'd rather spend directly in his business or doing some serious work stopping his armchair from floating away.

There are dozens of accounting packages available under CP/M. If you need one then you should go to a company or dealer who is willing to provide some support; if you don't need one then forget they exist. (In fact if your accounting needs aren't too heavy *SuperCalc* would probably do the job better and more easily than a dedicated accounting package).

And what about databases? The grandfather of the business database is *dBase II*. It's actually pretty straightforward to use until you get to the built in programming language, which is a bit cumbersome by present standards. This program holds the all time prize for least friendly user interface: a single dot on an empty screen!

Real men do for themselves

Most programs that run on the CPC ask the OS whenever they want to know which key was pressed or would like something to go to the printer. But it is possible for any program to do all the nitty gritty things for itself. However, that would mean knowing how the harware of the machine worked at a very low level.

For example, if you are writing a program to save your high scores to tape it's much easier to just CALL &BC8C to open the file (address of the filename in HL and its length in B) than to write all the code to operate the cassette motor, send out the bytes to the right port, worry about the timings and all the rest. An operating system does the dirty work for you.

Having said that, some games literally do take over the whole machine to gain maximum speed and to perform tricks with the hardware that the operating system would never allow.

That's the beauty of CP/M

Is CP/M just for the irredeemable Luddites of the world or does it really have something to offer the CPC enthusiast? The answer is yes. The main advantage CP/M has is the enormous software base for it, vast numbers of languages, business programs, enthusiasts programs (software to help radio amateurs bounce signals off the moon, even).

There are comms programs galore, mathematical packages, and stuff whose purposes are so obscure that you need an evening to find out what they're all about.

CP/M is where you look for the limits of the CPC's usefulness, and you will be surprised at just how much your machine can be made to do. ●

The Gary Kildall story

It's hard to imagine someone sitting down and actually inventing something as ubiquitous as CP/M. It's one of thos things that always seems to have been with us. Way back in 1972, however, that's exactly what Gary Kildall did.

Yes, Gary Kildall is the man we all have to blame, eh, to thank, for CP/M. Since he wrote it he estimates that the company he founded, Digital Research, have sold more than three million copies of the operating system – a figure that makes games software sales look a little weak.

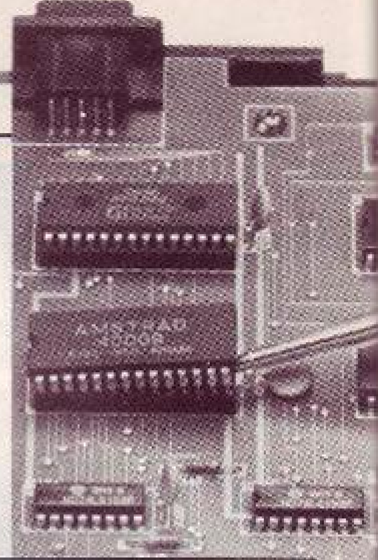
In the beginning Digital Research was just Gary and his wife, Dorothy, working out of their garage. To tell the truth it was mostly his wife, since Gary had to spend a lot of time under the polar ice in a nuclear submarine (did I mention that he was in the US Navy at the time?).

As an interesting but irrelevant aside, CP/M almost became the standard operating system for IBM PCs. Legend has it that when IBM were looking for an operating system for their new PC they came calling on Gary, but he was off flying his new plane.

IBM men are never easily beaten so they popped over to a little outfit called Microsoft instead, and asked them if they had something handy. Bill Gates of Microsoft said 'Yes,' and the rest, as they say, is money. Sorry, I mean *history*.

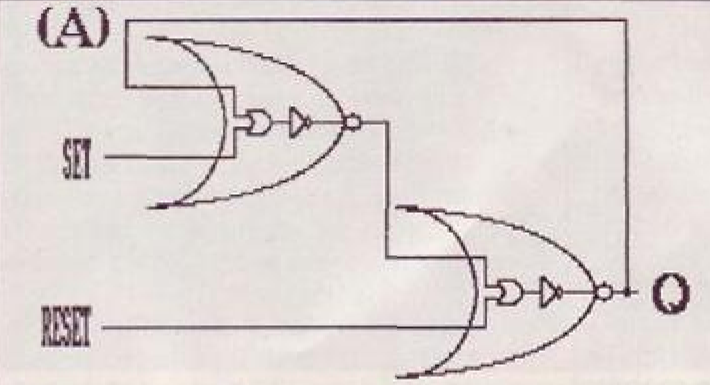


● Gary Kildall, the man who wrote CP/M



Inside out

In the second part of a series explaining just what is inside your CPC, STUART McCOLL says thanks for the memory.



(B)

R	S	Q
F	F	Q
F	T	T
T	F	F
T	T	F

● Figures 1(A) and 1(B) show a Reset-Set flip flop, one of the earliest memory devices. Figure 1A illustrates how it is done, and Figure 1B (right) shows the input/output configuration for the device

Last month we ended by showing how logic gates could be used to construct simple decision making circuits. Because of their versatility, logic gates are also used to construct another extremely important feature of computers: memory. A small microcomputer may have, say 16K bytes of RAM. This means that there are 16,384x8=131,072 individual binary digits or *bits*, each capable of storing a single piece of information: on or off.

Just how can an electronic device remember something? There are different kinds of memory cell. For the moment let's discuss just one to illustrate how they work, before going on to introduce some more sophisticated implementations actually used in the CPC.

R-S flip flop

A Reset-Set flip flop is one of the earliest memory devices, and can be constructed using just four of the logic gates with which we are already familiar. Figure 1A illustrates how it is done, and the truth table in Figure 1B shows the input/output configuration for this device.

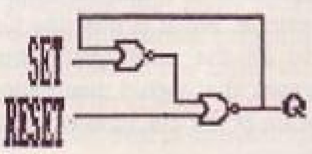
When Set is TRUE, the output, Q, *flips* to TRUE. Similarly, when Reset is TRUE, the output, Q, *flops* to FALSE - hence the name 'flip-flop.' If both inputs are FALSE, the former output, Q, is maintained, and the device is said to be 'remembering' its former output. Notice that if both Set and Reset are TRUE, the output is always FALSE – and it is for this reason that the RS flip flop is rarely used for memory.

The larger symbol enclosing each OR and NOT gate is the diagramatic representation of another logic gate. This is the NOR gate (Not-OR) and it is constructed simply by inverting the output of an ordinary OR gate. The truth table for a NOR gate is given in Figure 2A, and a simplified version of the RS flip flop in Figure 2B.

(A)

A	B	C
F	F	T
F	T	F
T	F	F
T	T	F

(B)



● Figure 2A gives the truth table for a NOR gate, while a simplified version of the RS flip flop is shown in Figure 2B

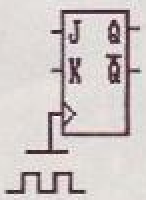
Devices such as the RS flip flop change their output as soon as a change occurs on its inputs. The flip flops in your computer, however, only change their outputs when the internal system clock ticks. This is to synchronise all the internal elements of the computer: otherwise it would get confused. Because such flip flops operate only on a leading (or falling) clock edge, they are called Edge Triggered Flip Flops, and all have the CPU clock signal as a common input. This signal, incidentally, comprises part of the Control Bus, which was introduced last time.

Clock this

Two popular edge triggered memory devices are the JK and D flip flops (seeFigure 3). The D flip flop is that which is commonly used to implement RAM. It simply 'clocks' its input through to its output on every leading (or falling) clock edge, and maintains this output until the next clock edge. Often the system clock is labelled as an Enable Signal because it tells all the devices when to operate.

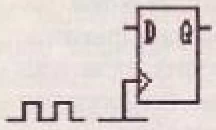
The CPU communicates with such flip flops (ie, RAM) over the system Data Bus. It typically addresses up to eight flip flops simultaneously, and such a collection is commonly called a Binary Term, or Byte. When a byte is part of a chip, it's called a Register. The number of bits which may be transferred in one memory cycle is the machine's limitation.

JK FLIP FLOP



J	K	Q
F	F	Q
F	T	T
T	F	F
T	T	$\overline{Q}$

D FLIP FLOP



D	Q
F	F
T	T

● Figure 3, two popular triggered memory devices: the JK flip flop (left), and the D flip flop

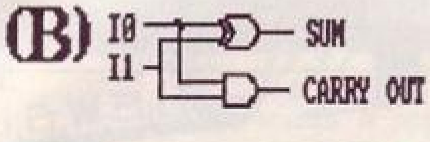
Catch the data bus

For example, many small microcomputers (including the not so humble CPC) have a

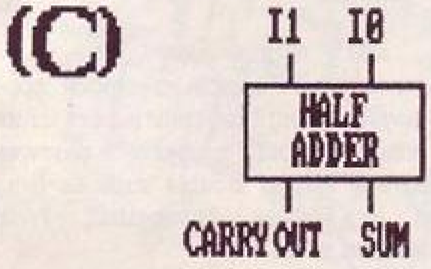
(A)

I1	I0	C	S
F	F	F	F
F	T	F	T
T	F	F	T
T	T	T	F

● Figure 4(A), a logic truth table constructed to illustrate the input/output configuration for every possible combination of states on the device inputs.



● Figure 4(B) shows the circuit (or logical) diagram for our device, the oddly named 'Half Adder'



● And figure 4(C): any larger device – a calculator, for instance – would refrain from too much detail, and simply draw a symbol like this

Data Bus consisting of eight wires, and they are consequently referred to as Eight-Bit Machines. These eight wires account for a large part of the maze on a computer PCB. Each wiring track provides a path for information to traverse. Devices which are part of the system are 'plugged' into these pathways so that they can communicate with the CPU.

Ever thought about how such devices know when the CPU is sending data, or when it is waiting to receive some? No? Well, all they do is inspect the state of another CPU output: the READ/WRITE line. This is typically High (True) when the CPU is Reading information from a device, and Low (False) when it wants to write data. Such a signal is also part of the system Control Bus.

So, now we know how to construct circuits to store information – and we already know how to build circuits to perform logical operations.

Number crunching

But we still haven't answered one of the question which we posed last time: *how do computers manage to perform mathematical marvels such as adding?*

It's probably easier to understand if we work through an example. Let's consider the construction of a circuit to add two one-bit numbers. Although it's not very useful, it illustrates the concepts involved, while avoiding too much complexity.

Let the inputs to out circuit be two one bit registers, denoted I_0 and I^1. The outputs, then, comprise a sum bit, S, and we'll also need a carry bit, C, to indicate when an overflow into the next most significant binary column has occurred.

As with logic gates, a truth table is constructed to illustrate the input/output configuration for every possible combination of states on the device inputs. Such a table is given in Figure 4A. You should be able to verify for yourself that Sum and Carry are correct in all cases.

We now wish to construct a device with two inputs – I_0 and I_1, and two outputs – S and C, which will obey this truth table. You should have realised by now that such a device is constructed from logic gates – such as those which we have already discussed. The problem is simply to work out which gates, and how they should be connected to achieve the desired outputs.

How? By its very nature, the truth table states when an output should be True and when it should be False. All that has to be done is to define a *logical expression* – which is nothing more than an often protracted Boolean statement – for each output. For example, the logical expression defining an AND gate is simply: Output = I_0 AND I_1.

There are a couple of fairly straightforward rules for deriving logical expressions from truth tables, and I'll state them here for completeness:-

1. For each Row, OR together the inputs, Negating any input which is False. Now AND this expression with the output (from that row) for which an expression is sought.
2. OR together the expressions obtained for each Row, to obtain an expression for the entire table, and simplify this if possible.

For our Device:-

Sum bit

Row 1: (NOT I_0 OR NOT I_1) AND FALSE = FALSE
Row 2: (I_1 OR NOT I_0) AND TRUE = I_1 OR NOT I_0
Row 3: (NOT I_0 OR I_1) AND TRUE = NOT I_0 OR I_1
Row 4: (I_0 OR I_1) AND FALSE = FALSE

SUM = (I_1 OR NOT I_0) OR (NOT I_0 OR I_1) = I_0 XOR I_1

Anyone for a carry out?

We could use the same procedure to derive a logical expression for the carry, but in this case, inspection of the truth table is quicker:
CARRY = I_0 AND I_1

Figure 4B shows the circuit (or logical) diagram for our device – which is called a Half Adder. Larger devices – for example a calculator – which contained Half Adders, would refrain from this level of detail, and simply draw a symbol such as Figure 4C.

Why is this called a Half Adder, do you think? With Half Adders, what do you think happens to the carry bit? Sure, if it happens to be zero, then who cares – but if the carry is True, then there should, of course, be a carry into the next most significant adder.

The FULL ADDER takes the carry into consideration by having a third input: $CARRY_{IN}$ Three inputs does of course mean that there are 23=8 possible outputs. These are enumerated in Figure 5A, together with the logical expressions for both $CARRY_{OUT}$ and SUM.

Normally, $CARRY_{OUT}$ is connected to $CARRY_{IN}$ of the next most significant adder, allowing binary numbers much larger than one to be added together (Figure 5B). What do you think would happen, though, if $CARRY_{IN}$ was kept permanently 0 (or LOW)? Yes, that's right – we'd have a Half Adder again. You should try and draw the circuit diagram for a Full Adder – it's just a straight translation from the logical expression. ●

Now that we understand how computers manipulate numbers and make decisions, we're ready to tackle the other, slightly more complicated devices which form the basic building blocks of every computer.

Surprisingly, there aren't very many such devices – and next month we'll discuss those which aid our understanding of computers (the most important ones) as a prelude to *system design*.

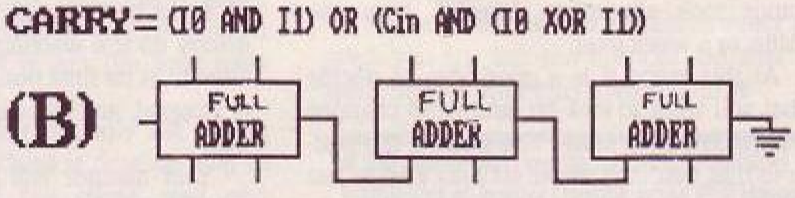
(A)

Cin	I1	I0	C	S
F	F	F	F	F
F	F	T	F	T
F	T	F	F	T
F	T	T	T	F
T	F	F	F	T
T	F	T	T	F
T	T	F	T	F
T	T	T	T	T

● Figure 5(A): possible outputs of the Full Adder

SUM = Cin XOR I0 XOR I1

CARRY = (I0 AND I1) OR (Cin AND (I0 XOR I1))



● Figure 5(B): how binary numbers of much larger than one can be added together

Insider dealing



● Press keys CHEAT together on the start screen and then L to move level – not so *Impossaball* after all!

Breaking into software isn't something only pirates do. It's also a form of detective work for the likes of PHIL HOWARD, as he reveals in the second part of this fascinating series



Last month's *Insider Dealing* should at least have persuaded you that the world contained within your favourite program need not be just another one of life's little mysteries. Now it is time to look at the process of hacking in a little more detail, and,since most interest is in games software, that's where we shall concentrate our attention.

The first thing to do is look at is what a program actually *does*. You do this every time you play the game anyway, of course, but it's well worth jotting down a few notes to remind you what goes on, and when.

What you are looking for are things such as:

- the sequence in which different sections of the game follow one another;
- what the screen messages are;
- when they appear;
- the keys that are used;
- the numbers involved (lives, energy, scores, times, etc.);
- what they start at and how they appear on the screen – are they numeric, graphic representation or 'energy bar'?

These last types, the 'energy bar' counters types are notoriously difficult to track down inside a game. There is simply nothing specific to look for. But, if you can count how many steps they take to reduce to zero it may give a clue to their detection.

In general, then, what you are attempting to do is to take note of anything at all that might help identify a routine in the program, and write everything down that you discover. Things look altogether different from the inside, or a week later.

At this stage it is a good idea to decide what you want to look for, and what changes you would like to make. The truth of the matter is that you may never actually find it, but if not, something else will most likely turn up on the way, and it may serve your purpose better. Normally, however, the goal is to stop the energy/lives counting down and giving you that fatal early bath.

To provide infinite lives is obviously your main objective, but also try, if you can, to isolate individual sub-routines within the program; then you can bypass the function that they perform, such as collision detection or timing. This can be acheived by placing a &C9 (return) at the start of the routine – should you be able to find the start, that is!

Read the programs header, if it has a header, to find out where it loads in the memory, and try to locate the address where the code eventually runs: it may not be the same. This enables you to follow the **ABSOLUTE** jumps, calls and pointers around the system.

Games to swear by!

Make a note, too, if you can, of the start/ execution address of the program from the header or basic/code loader. Remember that unlike



BASIC, code programs rarely start at the beginning of the file. Sometimes the execution address is difficult to get hold of, in which case you may need to track it down. A useful series of numbers to look for is &F3 (disable interrupts) followed by &31 (load SP). SP is a double byte register holding the Stack Pointer, and is often re-positioned early on in a program.

Black box owners, of course, can let technology do the walking for them. The code is already at its final position when the program is stopped, and the cursor is at the stop position.

Your monitor will have a function which enables the contents of the memory to be displayed in its ASCII form. It is well worth looking through the entire program with this function, and noting any addresses where legible messages appear. You may, by doing this, come across information concerning built in cheats or passwords, saving any further trouble such as can be found in *Savage*, *Impossaball*, *Freddy Hardest* and so on.

Similarly, scanning through the older adventure games particularly – newer ones tend to compact the text – can turn up some very useful hints.

You may, however, often turn up strings of obscenities, so just be careful who's looking over your shoulder! (Really, Imagine that: those *Bad Dudes* should have been Rude Dudes!)

How to save your life

The ways to strip your lives are numerous, but fortunately programmers often use similar methods, so roughly speaking all the games you are likely to meet can be split into three categories, depending on the type of system they use.

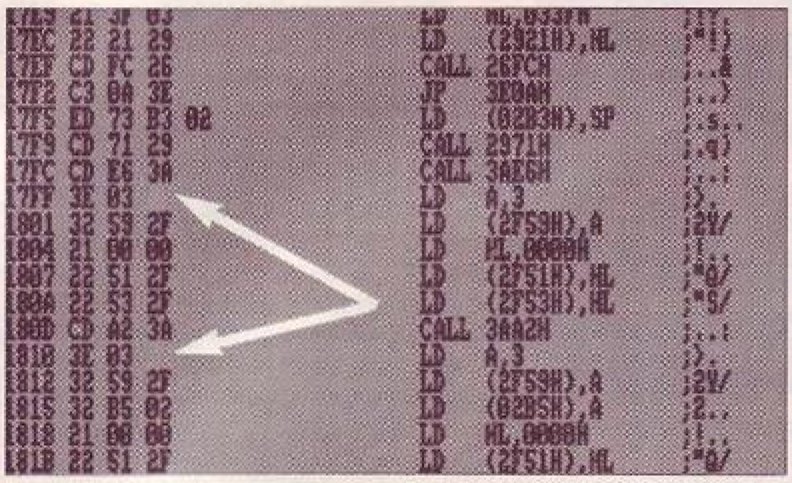
The first type all use exactly the same system, and are relatively easy to deal with. A

Secret code masters

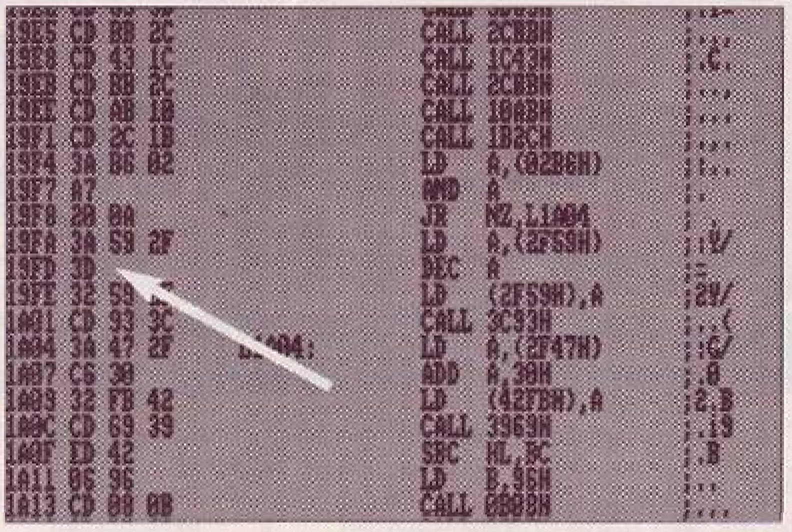
The Oliver twins, of *Dizzy* and Codemasters fame, generally build cheats into their games, to help them as they're de-bugging the code.

These are accessed by passwords (entered in pause mode) that are unusual to say the least.

***Ghost Hunters* has C.O.M.P.L.E.X., *Dizzy* has T.R.O.W.B.R.I.D.G.E. - where they live – and *Race Against Time* has I.N.T.E.G.R.A.L.**



- Two disassembled listings from *Bomb Jack*.
- Left: lives are stored at &2F59. This is a peculiar example, though, since the lives are stored at both &17FF and again at &1810.



- Right: that's what you want! Now, go to &19FD and *zap that 3D!*

considerable amount of programmers use this method, so you can



- A cheat for *Race Against Time:* pause the game, then type INTEGRAL – it couldn't be simpler!

expect to find it in probably 30 per cent of games. The system employs the 'A' register to decrease the number of lives by one, using &3D (dec A). All you need to do is locate the correct &3D and take it out.

Here's how:– The monitor should have a **BYTE-SEARCH** function, which looks through the memory for a particular byte or series of bytes. This function is extremely useful, but remember that it searches the whole memory, and one of the references it will find is its own comparison in the monitor itself.

Supposing the number of lives in your game is three. The program is obliged to store that number in the memory, and then at the appropriate moment, find it, decrease it, and put it back where it was. (M/C code is much more rigid and specific than BASIC.) Somewhere near the start of the program there has to be a routine which sets up the variables. Using the BYTE-SEARCH, locate the number series &3E, &03 (ld A,03). You will find that close following there will be a 3 byte instruction &32, &XX, &XX (ld (memory location XX XX),A). This address, XXXX, is where the lives are stored throughout the game. – It is possible however that there may be more than one of this sequence, so examine them all. – At this point you could, if you wanted, replace the &03 (number of lives) with a larger value, possibly &FF, so that you will start the game with 255 lives.

Having decided on a memory location that you consider will be a good bet (ie &2F59), use the BYTE-SEARCH to locate all references the program makes to it. Remember that the Z80 convention is to store all double byte numbers LOW BYTE FIRST, so your search must be for the sequence &59 followed by &2F. This search should produce two or three references where the program accesses this location: one of these will be the routine to reduce the lives.

The following sequence is routine to find:

- &3A, &59, &2F (ld A,(what's at &2F59));
- get the lives &3D (dec A);
- decrease the lives &32,&59,&2F (ld(&2F59), what's in A);
- put back the lives;
- replace the offending &3D with an &00 (nop, or no operation) and the program will no longer decrease your lives.

Generally this does the trick. One drawback, however, is that &00 (nop) has no effect on the flag register which is usually sampled to determine whether or not the lives have run out.

If the the flags are wrongly set up on entering the routine, there is now nothing to re-correct them and the game may end abruptly.

With this in mind, it is wise to replace the &3D (dec A) with &A7 (and A). This will leave the A register (number of lives) as it is, but reset the flags.

You will not find this system in every program you try, but the chances are that you won't have to wait long until you do. ●

A plea for help!

Kate Donnelly wrote to ask about using published pokes on games transferred from tape to disk via utilities such as *Bonzo Meddler, Speedtrans* and so on.

Unfortunately, as you have no doubt found out, Kate, they don't work, and there is no easy solution. Published pokes consist essentially of two main parts: one to deal with the protection and gain control once the game has loaded, and the other to actually alter the coding of the game to produce the cheat.

What the tape/disk utilities do is to work their way through the protection, save the entire usable memory to disc (so they don't miss any game code) and then create their own loader to load (relocate if necessary) and run their saved code.

The problem is that the published pokes are specifically designed to work on the games original loader/protection and can't 'understand' the newly created loader. It should be possible, however, to intercept the new loader(s) before jumping into the game, getting the poke in that way. The authors, Nemesis, Goldmark et al may have already thought of doing this (they are after all hacking utilities).

If not, perhaps someone who uses these utilities regularly has written one that allows the published Multiface pokes to be used, instead of the entire routines. Get in touch, at this address: *Insider Dealing, AA*, 4 Queen St, Bath BA1 1EJ.

- Stay tuned next month for another thrilling instalment of *Insider Dealing*, when Phil Howard reveals more hacker's trade secrets!

ABSOLUTE BEGINNERS

Now it really is the end for ANDY WILTON

This is the final instalment in ANDY WILTON'S mammoth series. We hope you've learned from it, and for those of you who've just joined us – *where have you been all this time?* Back copies of some, but by no means all *AAs* are still available from the mail order section at the back of each issue: *Absolute Beginners* began back in issue 28 (doesn't time fly, fancy that, well I never etc).

Just like numeric variables, strings can be assigned to by INPUTS. Try this one out:

```
10 PRINT "What is your name";
20 INPUT name$
30 PRINT "Hello,"; name$;"!
   My name's Arnold."
```

There are more useful things you can do by inputting strings. Take a look at these few lines:

```
90 PRINT "Do you want to carry on";
100 INPUT reply$
110 If reply$ ="no" THEN END
```

Notice how in both these examples the CPC prints the *prompt* – the question your input is supposed to answer – complete with a question-mark, even though neither PRINT message has one.

That's because the question mark doesn't come from the PRINT command at all – it's actually put up there by the INPUT, immediately before you get the flashing cursor. If you want to prove this for yourself try deleting line 10 in the first example, or line 20 in the second.

Of course without the prompt messages your program is much harder to use. A bare question mark doesn't tell you what information you're supposed to input, or even whether it's a string or numeric variable the INPUT is assigning to.

To make programs friendly and pleasant to use, you'll almost always want to print some sort of prompt message before putting up the input cursor. Input prompts are so common, in fact, that Basic makes special provision for them. Instead of using a separate PRINT statement before the INPUT, like this:

```
10 PRINT "What's the capital of
   Baluchistan";
20 INPUT capitals
```

You can do the whole thing with an INPUT statement alone, like this:

```
10 INPUT "What's the capital of
   Baluchistan";capital$
```

This saves a bit of typing effort, but more importantly it makes your program more readable. In the second version it's obvious at a glance that the Baluchistan message is a prompt.

There is a reason, though, why you might still want to use a separate PRINT command as in the first version. Imagine you want to vary the prompt according to circumstances, or previous inputs perhaps. If you try doing that with just one INPUT, you'll come a cropper. Take a look at this attempt:

```
10 INPUT "What's your name"; name$
20 INPUT "What's the capital of
Baluchistan,
   ";name$;capital$
```

It's supposed to produce a dialogue like this:

```
CPC: What is your name?
YOU: Archibald
CPC: What's the capital of
Baluchistan, Archibald?
```

Unfortunately, when the program encounters that 'name$' in line 20 it assumes that's the string you want the INPUT command to assign to. To avoid this you have to do the second prompt and input longhand, like so:

```
20 PRINT "What's the capital of
Baluchistan, ";name$
30 INPUT capital$
```

The prompt message of an INPUT command is the only place I know where you can't use a string-name or string-expression (like `a$ + CPC"`) to replace a piece of text in quotes.

Multiple inputs

Where you want two or more pieces of information to be input at the same time, you can use a multiple input like this one:

```
10 INPUT "What coordinates do you
want";east,north
20 PLOT east,north,1
```

When the prompt comes up, type in a number between 0 and 399 for the point's height, and finally hit Return.

The CPC uses the comma to work out where the digits of east's value end and those of north's value start. Try typing in only one number and seeing what happens. Then try typing in three or four, all separated by commas.

This is all very well as far as numeric INPUTS are concerned, but what happens if the CPC finds a comma in the text you enter at an INPUT command?

The comma could mean one of two things. It could mean, 'I want the string's new value to contain a comma' or it could mean, 'This is where one string value ends and the next begins.'

The CPC solves the problem quite simply. As far as it's concerned, any comma it finds in your reply to an INPUT is meant to separate strings. If you want it to treat commas as part of string values, you must use the command LINE INPUT. (LINE and INPUT must have a space between them.)

Try this little program out – it should show you what the difference is between INPUT and LINE INPUT:

```
10 INPUT "Well";a$
20 PRINY a$
30 LINE INPUTT "Well";b$
40 PRINT b$
```

Run the program, and to each "Well?" type in the reply 'What does happen after the comma, I wonder?' The CPC then prints out however much of this input each command could handle.

As you can see, the whole of your input goes into the LINE INPUT string, comma and all. You can input only one piece of information at a time with LINE INPUT, and that must be a string value. Otherwise the command behaves just like the simpler INPUT.

Absolute end

So this is the end of the series. We've covered all the basics of Basic over the past ten months. You're no longer an absolute beginner. If this were *Elite* , you should by now be rated at least 'Dangerous'!

Happy programming! ●

This time it really is the end for *Absolute Beginners* – sort of... Although this is the last part in the current series, Pat McDonald is working himself up into a high state of excitement (not a pretty sight) in anticipation of the new series for you now proficient programmers. Only thing is, we can't decide what to call it. 'Not Absolute Beginners' isn't quite right, is it? Any ideas? (We never do the work if we can get you to do it for us!) A tenner if we use your idea. Send your stunning title now to: Headline Selection Department, *AA* 4 Queen St, Bath BA1 1EJ

HELPLINE

NEW ENTRIES

And *still* the new entries flood in! There have been more new entries recently than ever before. Keep it up!

Steve

All the help you could want – printouts, tips, pokes, advice on CPM2.2. Send 10p per help required (phone help free). Will also debug or type listings on tape or disk from AA16-45 free!!!
Christopher Street, 43 Ridgedale Rd, Bolsover Derbyshire S44 6TX ☎ 0246 827135 after 5pm

Penpals wanted. Desperately need help on Platoon and Green Beret
Alastair Davis, The Old Vicarage, Meerbook, Nr Leek, Staffs ST13 8SJ

Penpal wanted – especially UK or Germany to teach me machine code & swap cheat modes. I'm 15
Paul Chen, PO Box 126, Burwood, NSW, Australia 2134

Penpals wanted of any age
Amz Hijazi, 94 Mellitus Street, London W12 OAS ☎ 01 743 6607 between 4.30-8.30

Free info on how to make up to £250 weekly at home in your spare time. Send large SAE
Christopher Bowler, 318A Wrythe Lane, Carshalton, Surrey, SM5 1AF

Will print listings and screens for free (within reason!). Send tape/disk. Help on AA Studio, Dk'tronics speech ROM. Tasword, DMP2000, loading tape software, very basic hardware problems & more
David Carter, Ruxley House, 28 Mt Hermon Rd, Woking, Surrey GU22 7UH

Help on Ghostbusters, Battle Valley, Werewolves of London & Biggles. Send SAE
G. Milnes, School Bungalow, CP School, Stockton-on-Forest, York YO3 9UD, N. Yorkshire

Tape to tape anything! Send 50p, SAE, game & blank tape. Money back if not successful
Carl Wilson, 64 Fishponds Rd, Kenilworth, Warks, CV8 1EZ

Disk backup available. Send formatted disk. Penpals wanted (16yo, serious & games).
James 'Spock' McQuarrie, 16 Ballaig Ave, Bearsden, Glasgow, G61 4HA

Want help with basic and some machine code? Then send SAE to:
Richard Shepard, 39 Vicarage Ave, Cheadle Hulme, Cheshire, SK8 7JW

Bards Tale: 3rd-13th level characters. Many magical items: lightwands, dayblades, crystal sword, rings, staffs & kiels axe. Send SAE with disk & 50p postal order. State what level & which items you require
Michael Parker, 17 Mead Close, Knutsford, Cheshire, WA16 ODU

464 owner wants penpals. All letters answered
Raymond Phelan, 1 Annaly Rd, Cabra, Dublin, Eire

Help! I want to get Deluxe Video, Deluxe Paint 2 & Degas elite for 464. Will pay a few bob
Daniel Bourn, 41 Horsham Ave, London, N12 9BG

Help with Basic, Machine Code (must have an assembly listing), Maxam 1.5, Devpac 464, Protext (on ROM), and Demon Development Cartridge. Send cassettes or listings (no disks)
Jonathan Cox, 34 Viking Rd, Acomb, York, YO2 5EZ

Help with almost loadsagames. If anyone is interested in reviewing an adventure of mine, with hint sheet, send a blank tape or disk with SAE
James Griffiths, Passby House, Lysonnen Rd, Carmarthen SA33 5DX ☎ 026782 443, 4.15pm-7pm Mon-Fri

Lots of pokes & Multiface pokes all on one tape. Write to:
Richard Marsh, 16 Bincombe Drive, Somerst TA18 7BE

Free everything, hints &c on old and new releases from Manic Miner to Total Eclipse! Penpals age 14-16most welcome to write
John 'Joystick repair' Lowe, 63 Greenwood Avenue, Worsley Hall, Wigan ☎ 0942 211911 (6pm-10pm)

Anyone got an AA20 they're willing to part with? Penpal 12-14 required – all letters answered
Stephen Lubb, 14 High Lees Rd, Mixenden, Halifax, West Yorkshire, HX2 8TF

Maps, hints & tips for games eg Seabase Delta, Smashed, View to a Kill. Will gladly map your games for a small fee. Map=30p, tips=20p
C. Karsan, 36 Eastcote Ave, South Harrow, Middlesex, HA2 8AL ☎ 01 423 2911 (evenings only)

Penpal required: age 16, competent with Basic into EMU/music software. THFRO, Footy, car sims, Jet Set Willy. 6128. Please live near or move house. I love you.
Michael Aidulis, 45 Braidholm Rd, Giffnock, Glasgow, G46 6EN, Scotland

Eproms are expensive! Backup of your Eprom: £7.95 or £13.95 2 Roms, including p&p. Send original Rom(s) & cheque/po (or sae for details) to
B. Pedrick, 40 Cumberland Crescent, Chelmsford, Essex

Pokes, tips on Matchday II, Equinox, Tau Ceti, Gauntlet, Gryzor, GP Sim, Footballer of the Year & 20+ more. 20p per game
Paul & Dan Irving, Surmang, Cranham, Glos

Type ins typed in, 1p per line. Send copy of listing and blank tape
D. Hargreaves, 2 Cornwallis Drive South Woodham Ferrers, Essex CM3 5YE

Basic debugging, programming help &c. Send tape/disk or listing
Kevin Mesnard, 60 Villiers Place, Boreham, Chelmsford, Essex CM3 3JW
☎ 0245 450 896

Need help on putting database files in alphabetical order. Anyone want help on writing a database? Penpal wanted for 15 yo 6128 owner
Adrain Forbes, 37 Victoria Rd, Gourock, Scotland, PA19 1DF

Adventure game: superb graphics, called 'Ichor,' set in an Egyptian' nobleman's villa. Talk to animals etc. Send £2 Cheque/postal order + SAE & you'll receive game within two days of me getting your order!
Lee Joynes, 36 Haskell St, Highgate, Walsall WS7 3LH ☎ 25798

Pokes, tips & maps for any game you care to mention. Please send 20p per game, & large SAE
Martin Dillon, 176 Coal Clough Lane, Burnley Lancs, BB11 4NJ

Rastan, Matchday II, Robocop, Salamander, Pacland, 4 Soccer Sims, Thunderblade, Warhawk, R-Type, Joe Blade II, Roadblasters, Combat School – and a football-liking penpal!
Shaun Eccleston, 9 Laburnum Grove, Beech Hill, Wigan, Lancs ☎ 46961

Tape users! If you've a Basic program that won't load due to a Read error, I may be able to retrieve it in part or whole. Ring with details of length and error. Basic and m/code programming and debugging, hacking games without hardware (send tape), help with dark side, driller and cholo. Basic progs speeded up, send it on tape & 50p (money back if I can't do it)
Michael Gledhill, 21 Newtake Rd, Whitchurch, Tavistock, Devon ☎ 0822 615406 after 6pm

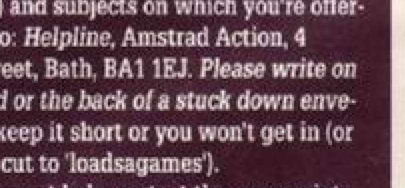
Listings printed 20p per page, send tape or disk with listing on and SAE. Pokes for many games, SAE for list, 20p poke per game. Penpals wanted for 6128 & Multiface II owner
Russell Whitwell, 2 Chase Mews, Chase Rd, Ross-on-Wye, Herefordshire HR9 5JQ ☎ 0989 66981

Feeling helpful? Just send your name, address, phone number (say if you don't want it printed) and subjects on which you're offering help to: *Helpline*, Amstrad Action, 4 Queen Street, Bath, BA1 1EJ. *Please write on a postcard or the back of a stuck down envelope* and keep it short or you won't get in (or you'll get cut to 'loadsagames').

If you want help contact the appropriate Helpliner – not us. By post include a self-addressed, stamped envelope for the reply – or you won't get one. And phone only in decent hours!

Piracy is not welcome: don't try it, you'll get booted off. Keep it legal. And if you receive SAE's, for heaven's sake return them with some acknowledgement. If you want to come off *Helpline* just write and say so.

All comments are the editor's.



TYPE-INS

Here, with more programs to turn you green, is PAT McDONALD

Symboliser

Here as promised in *The Look* is **Shabaz Yousaf** of Slough's excellent little program, *Symbolizer*. It can be used to redesign the CPC character set into whatever you want...

Admittedly the instructions contained in *The Look* are, shall we say, vague. Here comes the real story:–

When you start the program, a grid is displayed on the corner of the screen. The character being edited is displayed to the right of the grid: the default is `CHR$(65)`, or `A`. The design that you place on the grid (using the cursor keys to move around and `TAB` to set or reset pixels) is drawn normal size below the grid.

To change the start character simply alter the value of `n` in line 30 to read something like:–

```
30 n=whateveryouwant
   :reservend=n-1:SYMBOL AFTER
   reservend:start=n
```

To finish editing a character press `RETURN`. The program will store the edited character, and then progress to the next in the series.

Saving an edited character set is accomplished by pressing capital `S`. This will produce a Basic program that, when `RUN`, automatically sets up the character set. Note that if you edit characters below 32, then line 10 of this loader program will need correcting to set the `SYMBOL AFTER` limit lower.

```
{LrAn} 1 ' Symboliser
{JsBj} 2 ' by Shabaz Yousaf  PUBLIC DOMAIN
{KsBn} 3 ' For Amstrad Action July 1989
{AkAt} 10 MODE 1:DIM s(255,8)
{IvCs} 20 FOR i=&AF00 TO &AF06:READ a$:POKE i,VAL
       ("&"+a$):NEXT:DATA cd,60,bb,32,07,af,c9
{FvBq} 30 n=65:reservend=n-1:SYMBOL AFTER
       reservend:start=n
{FxBq} 40 PEN 3:FOR a=1 TO 8:FOR d=1 TO 8:LOCATE
       a,d
{ErAu} 50 PRINT CHR$(232):NEXT d,a
{GtBo} 60 PEN 1:LOCATE 10,4:PRINT CHR$(1);CHR$(n);
{MsAt} 70 a=1:d=1:ORIGIN 0,100
{JxBt} 80 LOCATE a,d:CALL &AF00:c=PEEK(&AF07):
       PRINT CHR$(232);
{JsCu} 90 IF INKEY(0)<>-1 AND d>1 THEN PEN 3:
       LOCATE a,d:PRINT CHR$(c);:d=d-1:PEN 1:
       GOTO 80
{EvDi} 100 IF INKEY(2)<>-1 AND d<8 THEN PEN 3:
        LOCATE a,d:PRINT CHR$(c);:d=d+1:PEN 1:
        GOTO 80
{AxCu} 110 IF INKEY(1)<>-1 AND a<8 THEN PEN 3:
        LOCATE a,d:PRINT CHR$(c);:a=a+1:PEN 1:
        GOTO 80
{IuCx} 120 IF INKEY(8)<>-1 AND a>1 THEN PEN 3:
        LOCATE a,d:PRINT CHR$(c);:a=a-1:PEN 1:
        GOTO 80
{NjBi} 130 IF INKEY(68)<>-1 THEN 170
{DmAx} 140 IF INKEY(18)<>-1 THEN 210
{JkAx} 150 IF INKEY(60)=32 THEN 280
{HmAm} 160 GOTO 90
{OpBk} 170 LOCATE a,d:PEN 3:PRINT CHR$(c);
{LjDx} 180 LOCATE a,d:CALL &AF00:IF PEEK(&AF07)=
        232 THEN PEN 1:LOCATE a,d:PRINT CHR$
        (143) ELSE PEN 3:LOCATE a,d:PRINT CHR$
        (232)
{GqCr} 190 IF PEEK(&AF07)=232 THEN PLOT (a*2)+100,
        150-(d*2),1 ELSE PLOT (a*2)+100,150-
        (d*2),0
{DtBi} 200 WHILE INKEY(68)<>-1:WEND:GOTO 80
{ArAm} 210 ad=1
{OtAv} 220 FOR d=1 TO 8:FOR a=1 TO 8
{PsAx} 230 c=TEST(100+(a*2),150-(d*2))
{InAv} 240 IF c=1 THEN s(n,d)=s(n,d)+ad
{FiAv} 250 ad=ad*2:NEXT a:ad=1:NEXT d
{GmCr} 260 nn=n-reservend:SYMBOL n,s(nn,1),
        s(nn,2),s(nn,3),s(nn,4),s(nn,5),
        s(nn,6),s(nn,7),s(nn,8)
{DiCp} 270 LOCATE 1,24:PRINT STRING$(20,CHR$(n));:
        n=n+1:reservend=reservend+1:CLG:GOTO 40
{CkAq} 280 SPEED WRITE 1
{KlAk} 290 CLS
{IuAt} 300 OPENOUT "CHARFILE"
{LkAw} 310 PRINT#9,"10 SYMBOL AFTER 32"
{LnAm} 320 lin=20
{EtAs} 330 FOR al=start TO 255
{FsAu} 340 PRINT#9,lin;"SYMBOL";al;
{EoBn} 350 FOR sc=1 TO 8:PRINT#9,",";s(al,sc);:NEXT
{KwAw} 360 PRINT#9,"":lin=lin+10:NEXT
{BpAo} 370 CLOSEOUT ●
```

● If you don't know what those funny bits in brackets at the beginning of each line are for, look at *Type Righter* in last months's *Type Ins*. Hint: you're not supposed to type them in!

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INTERLACE DEMO

Just for a change, here's a program especially for green screen owners. (Colour users can run it, but the results are far from perfect.)

Interlace doubles the onscreen resolution of your Amstrad in the y axis, that is rather than having 200 vertical pixels, it has 400. This *Type-In* is just a demo of the effect, but ardent programmers should be able to understand the method used.

Interlace has not been readily available before for the CPC. Put simply, the electron beam in the monitor, rather than scanning down the screen once every fiftieth of a second to display a screen, goes down twice per scan. It's set to slightly different increments, so first it does once set of slices down the screen, and then the alternate set.

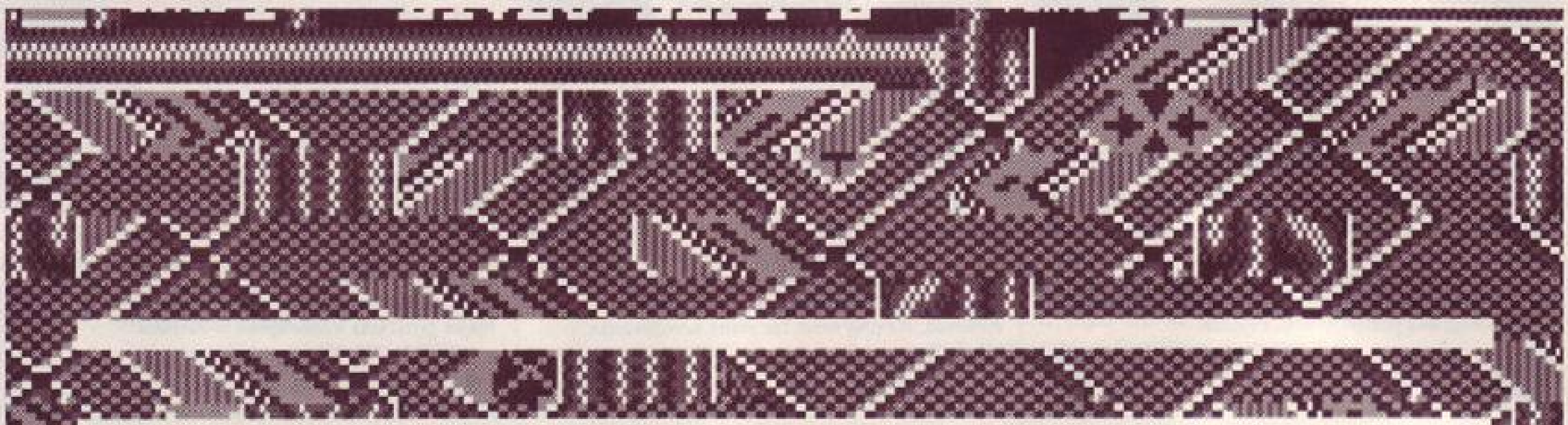
The program works best in green beacuse mono monitors are more persistent than colour ones, that is it takes longer for the image to fade away. This greatly reduces flicker, and in a pure machine code program it would dissappear entirely.

Because twice as much screen area is being used, twice as much screen memory is needed to store it. So memory from &4000 is set aside to display half the screen, the other half sitting at &C000 as normal.

The Amstrad continually flicks between the two halves while drawing the screen, and carries on when it's finished. (The picture is steadier once it has finished drawing.)

In theory, you could use a similar method to display more colours than usual. Just think – true 16 colours in mode 1! Or rather, 16 shades of green...

Well done JOHN VALENTINE of Eccles: a really idea provoking program for all those who were getting jaded with the CPC's display.



```
{AsAp} 70 ' INTERLACE DEMO
{IuAu} 80 ' Amstrad Action ** '89
{OwAr} 90 ' By John Valentine
{JuAp} 100 GOSUB 550:MODE 2
{JqAp} 110 SYMBOL AFTER 0
{JkBq} 120 CALL &BC06,&C0:CLS:CALL &BC06,&40:CLS
{NmBn} 130 CALL &BD19:EVERY 1 GOSUB 140:GOTO 200
{MoDo} 140 IF f=0 THEN OUT &BC00,5:OUT &BD00,5:
       CALL &BC06,&C0:f=1 ELSE OUT &BC00,5:
       OUT &BD00,4:CALL &BC06,&40:f=0
{KlAn} 150 RETURN
{NiBi} 200 FOR row=0 TO 7:FOR col=0 TO 31
{JsBj} 210 m$=CHR$(row*32+col):x=col*2+7:y=row+3
{PrAq} 220 GOSUB 510:NEXT:NEXT
{OlBl} 230 FOR a=1 TO 25:m$=CHR$(246):x=0:GOSUB
       510
{ItBi} 240 m$=CHR$(247):x=79:GOSUB 510:NEXT
{JjBj} 250 x=15:y=20:m$="Interlace demo - "
{LqBm} 260 m$=m$+"Let your CPC imitate an Amiga!"
{CkAm} 270 GOSUB 510
{MkAl} 280 GOTO 280
{DpAr} 500 ' TEXT ROUTINE (x,y,m$)
{GjAq} 510 FOR n=1 TO LEN(m$)
{KxBi} 520 CALL &8000,x,y,ASC(MID$(m$,n,1))
{PpBq} 530 x=x+1:IF x>79 THEN x=0:y=y+1:IF y=25
       THEN y=0
{GuAn} 540 NEXT:RETURN
{DmBi} 550 FOR n=1 TO 14:t=0:FOR a=1 TO 8
{PuAt} 560 READ N$:p=VAL("&"+n$)
{CiBk} 570 POKE &8000+add,p:t=t+p:add=add+1:NEXT
{OwCl} 580 READ tt:IF tt<>t THEN PRINT"ERROR IN
       LINE";4000+lin*10:LIST 1000-
{MmAo} 590 lin=lin+1:NEXT
{NwAm} 600 RETURN
{GlAw} 1000 DATA DD,66,04,DD,6E,02,CD,1A,891
{KjBi} 1010 DATA BC,11,00,08,19,7C,E6,3F,655
{JqBl} 1020 DATA F6,C0,67,22,67,80,11,00,823
{JlBj} 1030 DATA 10,19,7C,E6,3F,F6,40,67,871
{HxBk} 1040 DATA 22,6B,80,DD,7E,00,CD,A5,986
{EsBk} 1050 DATA BB,2B,06,00,23,7E,ED,5B,725
{HkBj} 1060 DATA 67,80,12,23,7E,ED,5B,6B,845
{NsBk} 1070 DATA 80,12,E5,CD,46,80,E1,04,1007
{OsBi} 1080 DATA 78,FE,04,20,E7,C9,2A,6B,991
{LxBi} 1090 DATA 80,11,00,08,19,7C,E6,3F,595
{AlBk} 1100 DATA F6,40,67,22,6B,80,2A,67,827
{FtBi} 1110 DATA 80,11,00,08,19,7C,E6,3F,595
{LqBj} 1120 DATA F6,C0,67,22,67,80,C9,E4,1235
{OiBj} 1130 DATA E9,00,00,E4,79,00,00,20,614
```

Discourse III

More Greek with JAMES WILSON, who proves that after all there's not very much new under the sun. (Erastosthenes, for example, calculated the circumference of the earth almost exactly – and that was 2,000 years ago!)

Ptolemy III, named Eurgetes (247-222 BC), continued the tradition of his grandfather in fostering the Great Alexandrian Library and encouraged the librarian Erastosthenes (276-194 BC) who is often considered to be the most learned man of antiquity.

Erastosthenes measured the earth by measuring the difference in the length of the shadows cast by the sun's rays at Alexandria and Syene, which was known to be 50,000 stadia due south.

He arrived at a figure of 250,000 stadia, about 25,000 miles – just 100 miles over the actual equatorial circumference!

The 'Sieve of Erastosthenes'

Like all the sages of his era, Erastosthenes spent some time studying numbers. He is probably best remembered for the 'Sieve of Erastosthenes.'

This method for finding the Prime Numbers operates thus -

Write down the integers (whole numbers). Circle the two, then strike out every second integer. Put a circle around 3 then strike out every third integer. The next un-struck integer is 5, so circle it and strike out every fifth integer. Proceed thus and the only unstruck integers will be circled and are the Prime Numbers.

Navy moves

In 1952 an interesting Prime Factor algorithm was published after its discovery by Captain N.A. Draim of the US Navy. In effect, this algorithm operates by sieving out the primes as possible factors of a number.

However, for simplicity,the form of the algorithm that sieves out the odd numbers generally will be propounded here. It is left to the amusement of the reader to make it more efficient.

To explain and show how the algorithm proceeds an example and its algebraic equivalent are given in parallel in the box below. There then follows a Basic Program which corresponds exactly to the algebra.

As in all the *Discourse* programs, change the value of a, the window parameter, if you want to re-direct the output to a printer.

In order to make the algorithm use less data memory, only the results from the current iteration and the one before are retained line 130 effects the switch as each iteration is completed. ●

```
10 '*********************************
20 '*                               *
30 '*  J Wilson : Prog. No 3 : July
1989    *
40 '*                               *
50 '*********************************
60 DEFINT a-z:a=0:i=0
      :c=1:r(0)=1:mode 2
70 CLS:PRINT #a,"DRAIM'S ALGORITHM
      TO FIND A PRIME FACTOR
      OF A NUMBER"
80 PRINT #a:PRINT #a
90 INPUT " Enter the number -";n(1)
100 PRINT #a:PRINT #a
110 s=n(1):z=SQR(s)
120 WHILE r(i)<>0
130 i=(i+1) MOD 2:j=(i+1) MOD 2
140 IF o = 1 THEN r(i)=0:r(j)=0
150 o=o+2:IF o>z THEN 230
160 p(i)=FIX(n(i)/o)
170 r(i)=n(i) - (p(i)*o)
180 m(j)=n(i) - r(j) - (2*p(i))
190 n(j)=m(j) + r(i)
200 PRINT #a,n(i)"= ("o"*"p(i)")
    +"r(i) CHR$(127);m(j)"="n(i)
    "-"r(j)" - ( 2 *"p(i)")
    "CHR$(127);n(j)"="m(j)"+"r(i);
     :INPUT #a," ";x
210 WEND
220 PRINT #a:PRINT #a,
    "Remainder (r(i))=0, thus"o"is a
    factor of"s" ...The other factor
    is"m(j):GOTO 240
230 PRINT #a:PRINT #a,o"exceeds the
      square root of"s"thus"s"is a
      Prime Number."
240 END ●
```

Let us factorise 4511 as an example of Captain Draim's Prime Factor algorithm.

Noting that 3 is the first significant odd prime:

```
n  1= (3 x p 1) + q 1      4511 = (3 x 15Ø3) + 2
m  2= n 1 - (2 x p 1)      15Ø5 = 4511 - (2 x 15Ø3)
   n 2= m 2 + q 1          15Ø7 = 15Ø5 + 2
              The next odd number is 5
n  2= (5 x p 2) + q 2      15Ø7 = (5 x 3Ø1) + 2
m  3= m 2 - (2 x p 2)      9Ø3 = 15Ø5 - (2 x 3Ø1)
   n 3= m 3 + q 2          9Ø5 = 9Ø3 + 2
              The next odd number is 7
Ø  3= (7 x p 3) + q 3      9Ø5 = (7 x 129) + 2
m  4= m 3 - (2 x p 3)      645 = 9Ø3 - (2 x 129)
   n 3= m 3 + q 3          647 = 645 + 2
              The next odd number is 9
Ø  4= (9 x p 4) + q 4      647 = (9 x  71) + 8
m  5= m 4- (2 x p 4)       5Ø3 = 645 - (2 x  71)
   n 4= m 4 + q 4                    511 = 5Ø3 + 8
              The next odd number is 11
Ø  5= (11 x p 5) + q 5     511 = (11 x  46) + 5
m  6= m 5 - (2 x p 5)      411 = 5Ø3 - (2 x 46)
   n 6= m 6 + q 5                    416 = 411 + 5
              The next odd number is 13
Ø  6= (13 x p 6) + q 6     416 = (13 x 32) + Ø
```

Here we see that there is a zero remainder when 416 is divided by the current odd number. In this case 13 is a factor of 416 and therefore a factor of 4511. The other factor is found by carrying out the next step of the algorithm:

411 – (2 x 32) = 347
and 13 x 347 = 4511.

If we reach an odd number which is greater than the Square Root of the integer we are trying to factorise then that integer must itself be a prime number.

In next month's *Discourse* we learn about Hero of Alexandria (ca. 62 AD) and his famous engine

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CHEAT MODE

More secrets of immortality with the man in black: TRENTON WEBB

Fast food

That little burger (?) Dizzy gets a helping hand with in his *Fast Food* frenzy, from GRAHAM SMITH of Somerset in the form of infinite lives. So now the wee fella can charge around to his hearts content and 'pig-out' in true style. Say yes to EGG-cess. (Tape method 1)

```
1 ' Fast Food, aa july 1989
2 ' By Graham Smith
3 ' Infinite lives
4 ' Method 1
5 '
10 MEMORY 14900
20 a=2850:LOAD"
30 FOR j=0 TO 31
40 READ a$
50 x=VAL("&"+a$)
60 POKE j+48640,x
70 y=y+x:NEXT j
80 IF y<>a GOTO 180
90 CALL 48640
100 DATA 2a,38,bd,22
110 DATA 20,be,21,37
120 DATA bd,36,c3,23
130 DATA 36,1b,23,36
140 DATA be,21,40,00
150 DATA e3,11,00,bb
160 DATA c3,4a,3a,af
170 DATA 32,0c,57,cf
180 PRINT"DATA ERROR
```



WEC Le Mans

Is WEC Le Mans still man and machine against the clock? No way José - not after ace mechanic PHIL HOWARD of Mapperley has played with your tappets! Ocean's racy little number gets a pasting, with infinite time. Lap it up! (Tape method 1)

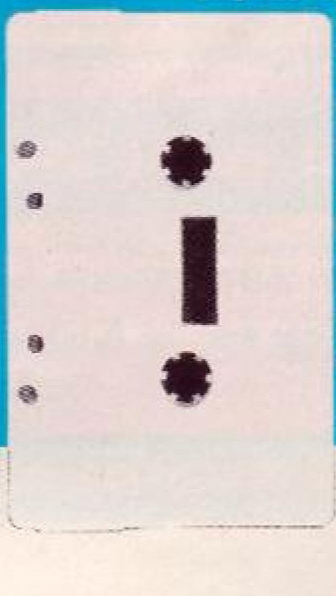
```
1 'wec le mans
2 'amstrad action July 1989
3 'infinite time
4 '
10 DATA 21,16,BD,36,C3,23
20 DATA 36,0E,23,36,BE,C3
30 DATA c5,99,21,17,BE,22
40 DATA 4e,A6,C3,08,A6,DD
50 DATA 21,b8,a8,11,ab,00
60 DATA CD,47,a8,21,2A,BE
70 DATA 22,61,a9,C3,e2,a8
80 DATA 3E,00,32,45,13,C3
90 DATA 72,80
100 y=0:MEMORY &5000
110 FOR x=&BE00 TO &BE31
120 READ a$:a=VAL("&"+a$)
130 POKE x,a:y=y+a:NEXT
140 IF y<>&14DE THEN 170
150 LOAD"wec
160 CALL &BE00
170 PRINT"data error!"
```

Poke methods on tape

Here's how to input most *Cheat Mode* tape pokes – the instructions for each poke tell you which of the two to use. 664 and 6128 owners: first type | tape.

METHOD 1

Rewind the game tape to the beginning, type in the poke listing and then type RUN and press the Enter key. (Don't use the key marked CTRL or Control, or the poke won't work.) Press the Play key on the cassette deck, then any key on the main keyboard - spacebar does nicely. The tape should now play through as normal.



METHOD 2

Skip the first bit of the game program. To do this, rewind the game tape to the beginning; type in the listing; now type CAT and press Enter.

Start the tape by pressing Play and then any key. Soon you'll see the message: "Found something Block 1". It doesn't matter what the something is, and it varies from game to game. If the *Cheat Mode* instructions just tell you to skip the first block, stop the tape here. If the instructions tell you to skip things, stop the tape when the "Found" message comes up for the last thing you're trying to skip.

Once you've stopped the tape, press Escape, type RUN and press Enter. Now press Play on the tapedeck and any key on the keyboard to start the tape.

Black box

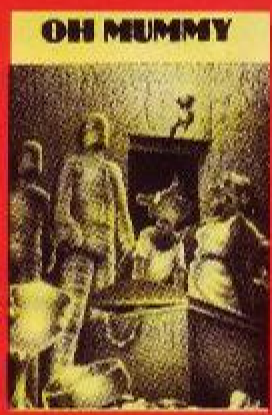
This month's Multiface massacre is the result of many hours of serious hacking by ANDREW REYNOLDS up there in rather wonderful Glasgow.

So dig out those games of yesteryear because it's party time!

GAME	ADDRESS	POKE	EFFECT
OH MUMMY	760E	00	Infinite lives
MANIC MINER	6FA9	00	Infinite lives
THRUST	4347	C9	Infinite lives
SPEEDKING	152A	C9	Stop clock
	1D90	C9	Stop collision with bikes
	1D8C	C9	Stop collision with grass
	22DA	C9	Music off
MONTY ON THE RUN			
	9CBC	00	Infinite lives
	9BE3	C9	No crushers



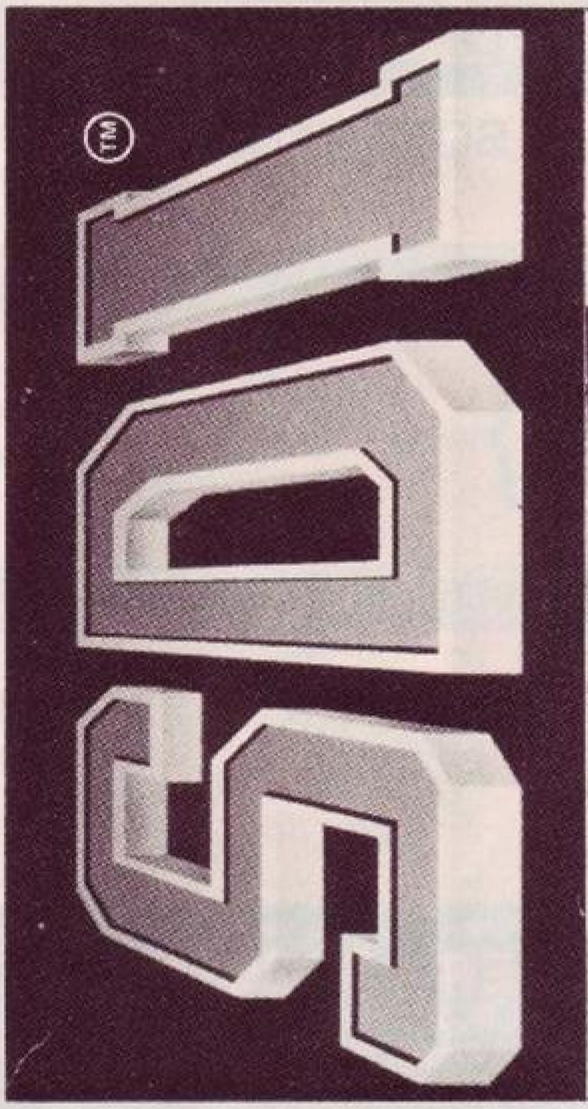






Multiface pokes: what they are, how to do them

- Most games are heavily protected these days, resulting in longer pokes.
- Many of you have one of the infamous black boxes that can be used to stop programs – the Multiface 2 from Romantic Robot for example.
- Often the only thing that they're used for is transferring games from tape to disk, but they can also be used to hack games for infinite lives etc.
- This occasional section is for owners of the Multiface 2 and similar devices so that they can poke games without typing in huge listings.
- Here's how you enter them:
- Plug the Multiface into the expansion slot at the back of your keyboard.
  (Multiface 2 owners: make sure that the switch on the front is in the up position.)
- Load the game that you want to poke in the usual manner following the instructions supplied with it.
  (Multiface 2 owners: move the switch to the down position after it has loaded.)
- Press the red button on the Multiface and a menu appears at the bottom of the screen. Press 'T' for tool and then 'H' to change input to hexadecimal.
- Press the spacebar and type in the number under the Addr column. Next type in the number under the Poke column.
- Repeat this process until you've entered all of the pokes that are listed for the game and then press 'ESC'.
- Press 'R' to return to the game. It then runs with the pokes that you've just entered.



SDI

Sky and BSB better watch their step, as PHIL ('it's that man again!) HOWARD from downtown Mapperley gives Activision's *SDI* satellite killer infinite lives. So the world is free, at last, to Rest In Peace. (Tape method 1)

```
10 'sdi
20 'amstrad action july 1989
30 'infinite lives
40 '
50 DATA 21,16,BD,36,C3,23
60 DATA 36,0E,23,36,BE,C3
70 DATA EA,99,21,17,BE,22
80 DATA 4F,A6,C3,08,A6,DD
90 DATA 21,b9,a8,11,ab,00
100 DATA CD,48,a8,21,2A,BE
110 DATA 22,62,a9,C3,e3,a8
120 DATA 3E,a7,32,49,3a,32
130 DATA 92,3A,c3,90,38
140 y=0:MEMORY &5000
150 FOR x=&BE00 TO &BE34
160 READ a$:a=VAL("&"+a$)
170 POKE x,a:y=y+a:NEXT
180 IF y<>&16AE THEN 210
190 LOAD"sdi"
200 CALL &BE00
210 PRINT"data error!"
```



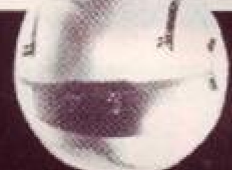
Afterburner

Lock on to this: PHIL HOWARD0 (oh what a surprise!) of Mappereley gives the graduates of Activision's *Afterburner* Academy immortality. Show those MIGs how to really shake, rattle and roll! (Tape method 1)

```
1 'Afterburner
2 'amstrad action july 1989
3 'infinite lives
4 '
10 DATA 21,16,BD,36,C3,23
20 DATA 36,0E,23,36,BE,C3
30 DATA C5,99,21,17,BE,22
40 DATA 4E,A6,C3,08,A6,DD
50 DATA 21,b8,a8,11,ab,00
60 DATA CD,47,A8,21,2A,BE
70 DATA 22,61,a9,C3,e2,a8
80 DATA 3E,3a,32,a7,20,C3
90 DATA 00,46
100 y=0:MEMORY &5000
110 FOR x=&BE00 TO &BE31
120 READ a$:a=VAL("&"+a$)
130 POKE x,a:y=y+a:NEXT
140 IF y<>&14DB THEN 170
150 LOAD"afterbnr"
160 CALL &BE00
170 PRINT"data error!"
```



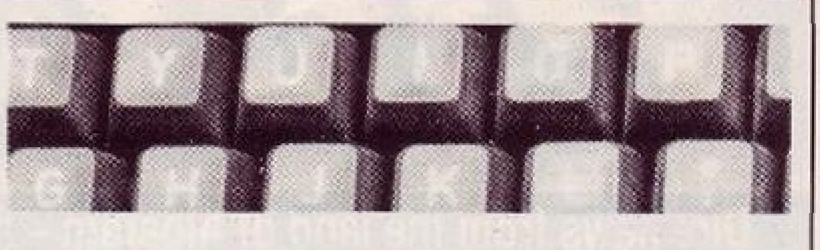
ISS



Do you find killer drones a real downer? Has the floor decayed under your sphere just once too often? Don't fret, UNCLE PHIL has discovered how to make your sphere immortal by giving you *(all together now!)* infinite lives, making Electric Dream's *Incredible Shrinking Sphere* slightly more survivable. All you have to do now is to find Col. Ridley. (Tape method 1)

```
1 'incredible shrinking sphere.
2 '
3 'infinite lives
4 '
10 DATA 21,fa,ac,36,c3,23
20 DATA 36,0e,23,36,be,c3
30 DATA 00,ac,c4,14,ac,21
40 DATA 19,be,22,2f,27,fb
50 DATA c9,3e,7e,32,54,07
60 DATA c3,80,9f,21,7f,41
70 DATA 36,8f,21,cc,41,36
80 DATA b3,21,2c,42,36,f9
90 DATA c3,05,40
100 y=0: MEMORY &3FFF
110 FOR x=&BE00 TO &BE32
120 READ a$:a=VAL("&"+a$)
130 POKE x,a:y=y+a:NEXT
140 IF y<>&1413 THEN 170
150 LOAD""
160 CALL &BE21
170 PRINT"data error!"
```

Bug killer!



We've all done it: typed in a long listing, only to find it won't run. Now *AA* offers hints on finding those damned elusive bugs.

You've typed in the listing and it doesn't work. You've spent hours scanning it and can't find any errors. You've had the whole family read the listing to you while typing it in. It still doesn't work. You've put a rope around your neck and are about to kick the stool... Stop! First take a look at this article. It gives you hints on finding those elusive bugs and points out ways to avoid making mistakes in the first place.

Why won't it work?

When you get `Syntax error` or a similar message the first thing you tend to do is blame the listing, saying it is incorrect. More often than not you'll find, if you recheck your typing, that the error was of your making. True, there are occasions when printed listings are incorrect, but very rarely.

If you are copying a program from a magazine or book here are some points to watch:

- copy exactly what you see;
- take care with your spelling;
- watch punctuation;
- don't leave lines out;
- make sure spaces are in the correct places;
- assign variables correctly;
- don't confuse letters with lookalike numbers (1 and l, for instance).

Copy correctly

It is very easy to type in commands, numbers, variables, data or anything else incorrectly. The CPC understands only a limited vocabulary of commands. If you invent new words you'll get the reply 'Syntax error.' You get similar rude remarks if you splice two commands together, or leave out spaces or hit a semicolon instead of a colon. It is so easy to fool your computer that you must be extremely careful what you type in. For example, the innocent-looking line:

```
1Ø IF B=Ø THEN PRINT a$:" "; ELSE GOTO 8Ø
```

First point: don't alter the line number (or for that matter any part of the program). If you do, then there's every chance that the program will not operate properly.

Notice the statement `B=Ø`. Certain letters and numbers, on some printers, look deceptively similar. Confusing Bs and 8s, Os and 0s, Is and 1s is very common. Type slowly, and if you're not sure whether a character should be, say, 1 or l then mark this down on a piece of paper. First try one character. If an error results use the other.

Use spaces. It is better to have too many than too few. This is the only way the computer can distinguish between one command and another. Remember every command or statement you use must have a space either side of it. If you leave out spaces, for example, and type `IFB=0` then, you've guessed it, 'Syntax error' will pop in for tea. The same happens when you join two commands together, such as, `THENPRINT`. This is not true for all dialects of Basic. It is with Locomotive Basic, though, so take care.

If your spelling is like mine, beware. The computer can be very cruel. You must be word-perfect with the commands you use. If you enter `PRIT` instead of `PRINT` the computer will be most unforgiving. Locomotive Basic is nicely designed, as it displays command words in capitals, even if you typed them lower-case. This makes spotting the misspelt command much simpler.

Pernicious punctuation

You'd be surprised how easy it is to use a semicolon (;) instead of a colon (:) and vice-versa. Semicolons are common in `PRINT` and `INPUT` commands. Their main use is to join strings of characters together on the same line. For instance, to print 'this that' with a change of border colour between the words:

```
PRINT "this ";: BORDER 0: PRINT "that"
```

Leave out the semicolon and 'that' will be printed on the line below "this".

Colons have an altogether different function. Leaving them out is more likely to induce an error message. They tell the computer that one set of commands has finished and another follows. In general you'll find a command followed by a colon, another command then a colon... Only a few commands can be coexist in one line without colons: `IF`, `AND`, `OR` and `THEN` are examples.

Other characters that can be confused are the fullstop (.) and comma (,); the minus sign (-) and underline (_); the apostrophe (") and grave accent or open-quote (').

Meaningful messages

Often the computer throws up a message that can be confusing or, worse, misleading. Sometimes the computer will say the error is in line such-and-such when quite often it's elsewhere. Here's some frequent errors.

Syntax error

The commonest of errors. This is probably the one message that tells you the actual line the error occurred in. If you have read earlier paragraphs then you should be in a position to judge why the error occurred.

Unexpected NEXT

You have placed a NEXT too few or a FOR too many in the listing. Each `FOR a` must have a `NEXT a` to complement it. Note that it is not actually necessary to specify the variable like `a` after the `NEXT` - this can cause problems when searching for the error. Take care that you don't next loops incorrectly. If you have loops within loops, the first one you entered must be the last you leave. Correct nesting:

```
FOR a=1 TO 5: FOR b=2 TO 6: NEXT b: NEXT a
```

Incorrect nesting:

```
FOR a=1 TO 5: FOR b=2 TO 6: NEXT a: NEXT b
```

Unexpected RETURN

Similarly, if you have used a `GOSUB` in your program then there should be a `RETURN` to match it. However, if you use a `RETURN` without previously defining a `GOSUB` then this message appears.

DATA exhausted

You have tried to `READ` data that does not exist. Or the computer cannot find any more data to read. Check your `DATA` statements carefully. If there are too few or you have placed a fullstop instead of a comma to separate items then you'll get an error.

Improper argument

This is the message that can bring tears to your eyes. It is the most difficult to find and cure. Rarely does the line thrown at you contain the error. Reading data, it can happen when you try to define characters while converting strings to numerical values... The only way to rid yourself of this one is to be cautious when copying `DATA` lines or assigning values to variables.

Type mismatch

Your Amstrad has encountered a string when it was expecting a number or vice-versa. This error occurs commonly when reading data. You'll generally get a message like `Type mismatch in line 20`.

There is no error in line 20; that's just where the program was when it tried to use the data. The mistake lies somewhere within a `DATA` statement.

These hints should give you some assistance, and cut down considerably the number of frustrating hours spent looking for that elusive mistake! ●

'Type Righter'

You'll notice that we've started printing listings with a column of characters alongside. They're not to be typed in, though – they're part of the 'Type Righter' program we featured in last month's *Type Ins*, to which the curious reader is referred. (See also this month's *Forum* for a brief alteration to the listing.)

PILGRIM

Dire news from the land of Albareth – a report on Origin Systems' *Times of Lore*

TIMES OF LORE

Microprose ● £9.95 cass, £12.95 disk joystick/keys?

Heralded for ages on the CPC, but only recently surfaced, *Times of Lore* claims to combine arcade action with adventure challenge.

The land of Albareth is in a tizzy following the disappearance of the High King and in a scenario reminiscent of a dozen others you must locate the various talismans needed to regenerate the spiritual values of your country and defeat the bad guys. This task is accomplished with the help of your joystick, some icons, a few multiple-choice menus, and a scrolling graphics window that gives you an overhead view of your surroundings.



If you're already wondering what on earth this has to do with adventuring, then join the club! However, the game is clearly marketed as a 'classic adventure featuring arcade thrills', so here goes with the Pilgrim's definitive report...

The principle of the game rests on exploration and interaction with other characters. Although there is no text entry, the icons enable you to pick up, drop, and use objects as well as examine objects and communicate with others. The joystick moves you about, and the landscape scrolls while your figure remains in the centre of the screen.

The land features buildings, castles, and natural features. When inside buildings you can go up or downstairs and view the sur-



● Fine, if you like that sort of thing...

rounding landscape. When outside buildings, the walls and roof become opaque and you cannot see what is happening inside, so frequent exploration is necessary and sometimes rewarding.

The rewards of exploration in *Times of Lore* range from meeting other friendly characters to locating specific objects. When adjacent to another character (not always easy as they move about a lot) you can select the 'talk' icon and 'Start chitchat' or ask about any one of a number of other topics offered in menu form. The list of topics depends on previous encounters, so that having a conversation about orcs may well add 'Orcs' to the list for interaction with later characters.



All this gives a good, well-thought out game-design that encourages perseverance and makes for quick, easy play. From the adventurer's point of view, however, there are serious drawbacks.

First, the introductory scenes are full of misprints and misspellings to the point of making nonsense of some of the sentences. This simply isn't on, lads. Ever heard of playtesting? There are also other points in the game where gibberish appears on the screen, but this doesn't really detract from the gameplay, just from the sense of having got one's money's worth. If you're spending a considerable amount of your hard earned on a new release then you don't want gibberish, however infrequent.

Second, the amount of area covered by the screen is too small to be truly satisfying. It's no coincidence that the most successful games that use overhead views (eg *Ultima*, also by Origin Systems) toggle between a large-scale and small-scale view. You can use the latter for wandering around the country, and the former for exploring buildings and small locations. *Times of Lore* has only small-scale and this tends to cramp the imagination somewhat. Mapping is essential, therefore – I know there will be some Pilgs, however, who find this a plus point.

Thirdly, the 'Examine' command works only on objects. This is perhaps the worst point of the game because it denies you the chance of getting any further, more detailed information about your surroundings. The inevitable conclusion is that the surroundings are not terribly interesting – and for the most part, in comparison with most text-and-graphic adventures, this is true.



My final gripe is that the joystick button is used both to select icons and to take a swipe at an adjacent character. This means that, in your haste to rescue Albareth (or is it Albereth? the program can't seem to make up its mind), you often start a friendly conversation with a character only to discover to your horror that you are hacking him down in cold blood. This doesn't make you many friends and can sometimes obscure vital information by making enemies of people who would otherwise provide you with essential clues. After being brutally savaged with a sharp dagger, they are, understandably, somewhat reluctant to engage in polite conversation.

That's about it for the gripes. The good news is that this game will almost certainly



● Not a great literary achievement, *Times of Lore*

appeal to those who inhabit that dark no-man's land between the world of adventure and the world of the arcades. If you're more of a puzzles and locations-description man (or woman) then leave it well alone. If you fancy a spot of running around, then take the risk, though I imagine that some of the shortcomings I've highlighted would dampen the enthusiasm of even the most ardent joystick waggler. ●

Atmosphere	55%
Interaction	60%
Challenge	80%
Overall	65%

Green Screen

Ugh! Whoever designed this game never intended to play it on a green screen. Many of the characters are almost entirely invisible except when they move and the objects they drop are even harder to detect. Playable – but for masochists only.

Level 9 and Mag Scrolls launch new systems

Both Level 9 and Magnetic Scrolls are busy working on new 'adventure' systems for release later this year, with Level 9's due out first in the summer.

The label 'adventure' systems is justifified because both companies are attempting to woo larger markets by maker greater emphasis on graphics.

In Magnetic Scrolls' case, these will – it is rumoured – be, gasp, animated. It all sounds a bit fishy, but watch out for full details soon on these very pages.

Level 9 are sticking more to the adventure line, and hoping to include RPG type features.

However it looks as if, unlike the *Bard's Tale*, you will only have one character to play around with. Again, there is a distinct smell of animated graphics.

Watch this space...

Where now for Magnetic Scrolls?

Following Microprose's purchase of Telecomsoft and the Rainbird/Firebird/ Silver-bird labels, Magnetic Scrolls are looking for a new publisher.

Although both Microprose and Scrolls are keen to do business together, neither of them has actually got down to the nitty-gritty of doing business. Meanwhile, Mag Scrolls are looking high and low for a new partner.

'Actually,' says Anita Sinclair of MS, 'this could all be in the player's interests. Although some of our product has been hard to get hold of because of all the trouble, the change of publisher will inevitably give us a new lease of life.

'It means,' she continued, 'that our new system [see above] will be even better designed – and better distributed – as a result.'

In the meantime, Magnetic Scrolls have written their first 'mini- adventure', called Myth, for free distribution by mail-order company Official Secrets.

There's one drawback, though: you only get it if you take out a subscription the company AND you have a PCW.

Unlike previous Mag Scrolls games there will be no CPC version. Shame!



●Anita Sinclair - looking for a new outlet for The Pawn, Jinxter, and other Mag Scrolls games.

Lords and Ladies of Adventure

Welcome this month to the redoubtable **Debby Howard** of Abbey Wood, London, who offers her assistance to other less fortunate souls.

And what about the rest of you then? Where are you, you skrimballs? Lurking in the Troll's Diner, I'll be bound! Send me a postcard with your name and address and jolly well offer some other people a spot of assistance, or you'll taste my staff!

The address for those with gumption is **The Pilgrim's Clue Pot, Amstrad Action Magazine, 4 Queen Street, Bath, BA1 1EJ.**

● *Aftershock, Brawn Free, Case of the Mixed-up Shymer, Forest at Worlds End, Grange Hill, Haunted House, Heroes of Karn , Message from Andromeda, Mindshadow, Rigels Revenge, Seabase Delta, Spytrek, Subsunk, Terrormolinos, Three Weeks in Paradise, Trial of Arnold Blackwood, Warlord*
Debby Howard, 10 Overton Road, Abbey Wood, London, SE2 9SD

– and here's a helpful offering from **Stuart Whyte** who's obviously not content with winning the *Amstrad Adventurer of the Year Competition*. He also has a message for the Pilg and other fellow adventurers:

'Could you remind everybody writing to a Lord or Lady of Adventure to enclose a SAE and say where they are stuck in the adventure? I enclose two letters *(he did, too! Pilg)*, one asking me about games I've never played and weren't in my list and the other asking me for solutions for, more or less, all the adventures I've completed! I phoned him up to see if I could help him on each adventure individually, only to find that he only had three of the adventures anyway!'

Now look lads and lassés, this isn't on. Treat the Lords and Ladies with respect and remember that they're there to help you, not change your nappies for you. Now here are Stuart's games...

● *The Bard's Tale, Bestiary, Classic Adventure, Dungeons Alchemists Amethysts 'n' Everything, Experience, Fantasia Diamond, Forest at the Worlds End, Gnome Ranger, Heroes of Karn, Hitchhikers Guide to the Galaxy, Kaiser, Leather Goddesses of Phobos, Lurking Horror, Magic Sword , Message from Andromeda, Moonmist, Price of Magik, Red Moon, Return to Eden, Ring of Darkness, Seabase Delta, Seastalker, Souls of Darkon, Starcross, Stationfall, Subsunk, Warlord, Wildbunch, Worm In Paradise, and Zork III.*
Stuart Whyte, 53 Ridgeway Road, Timperley, Altrincham, Cheshire, WA15 7HL. ☎ 061 980 4645



Clue Sniffing with the Pilgrim...

Lancelot

● *Blow the horn at the siege of Lyonesse.*
● **Fight the Black Knight but let him live.**
● *Also spare the Green and Red knights.*
● **Ignore the 30 knights who challenge you in Chapel Perilous and enter the inner chamber. Ignore the witch, take the cloth, and return with it to Meliot's castle.**
● *Get on the cart to enter Tintagel. Empty the cauldron, take the coals from the fire, and put them in the cauldron.*
● **Then enter the nearest ship and use the coals to set fire to the fleet.**

Pilgrim Post

Dear Pilgrim,
We're proud new owners of an Amstrad 6128 and keenly into adventures. Back in AA39 you mentioned the difficulty in obtaining older adventure games and wondered if anyone knew of a good source to obtain them. Has there been any response to this?

There are several older games we would like to get and as we live out in the Yorkshire dales in the 'Middle of Nowhere' and tend to rely on mail order. Can you help?

Gill Tovey, Glasshouses, N. Yorks

I can indeed, Gill. Try **Official Secrets, PO Box 847, Harlow, CM21 9PH**. This is a mail-order specialist adventure club where you pay an annual subscription and get very generous discounts...and I mean generous.

Some of the prices are really quite disgustingly cheap and the selection of games is very good.

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REMEMBER: You'll never get rich by digging someone else's "ditch". Anyone in the country including YOU, can become very rich in a relatively short period of time just by doing a few basic things! It's more rewarding than playing games. The benefits are many and varied. Full or part time.
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HOME BASED BUSINESS

31 PILTON PLACE (AA 2)
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WALWORTH, LONDON SE17 1DR

AA Buyers Guide

So you want to spend some money on your CPC? Well, first of all you need to know what's available. And here's the place to find it. We've listed the best and best known programs in each category, and given you the producer; the phone number; the price; the issue in which the item was reviewed; and last but not least, a brief description of the program's features and, where appropriate, shortcomings.

Don't take our word for it, though: we recommend you read the original review before you splash out, and, even better, ask the person from whom you're buying if it meets your particular needs. Best of all would be a try-out, if you can find a friend who already has what you're thinking of buying.

WORD PROCESSING

Brunword 6128

Brunning Software ☎ 0245 252854
£16.50 tape, £25 disk ● reviewed *AA24*
40 or 80 column mode: spell checker loaded into extra memory. Suitable for expanded 128K machines. Superscript/subscript affects on-screen. Includes Datafile. Available as 'Junior Brunword' at £12.95 in slightly cut-down version.

Mini Office II

Database Software ☎ 051 357 2961
£14.95 tape, £19.95 disk ● *AA6*



If you don't need full specification *Mini Office II* is the one to buy. Remarkably cheap for word-processor, database and spreadsheet, plus comms software and more. Packaging and documentation good, and programs work in a menu environment.

Pendown

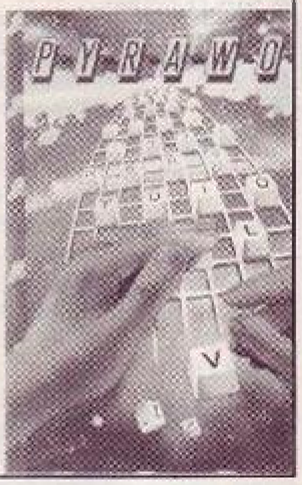
Logotron ☎ 0223 323656
£19.95 disk only ● *AA18*
A complete tutorial in the theory and practice of word processing – it's great fun, too. Open system, owing much to expensive DTP packages.

Protext

Arnor ☎ 0733 68909
£19.95 tape, £26.95 disk, £39.95 ROM ● AA3
Lightning fast on all tasks involving screen. True merging from separate files and disks to the cursor position is easy, and *Protext* supports standard CPC RSX's like DISC, TAPE, CAT etc. ROM version is excellent. Bad points: maximum file space limited to machine memory – about 22K on disk, 38K for the ROM version. As used by *AA*, if that's any recommendation (probably not, actually!).

Pyraword

Discovery ☎ 0742 753423
£14.95 tape, £17.95 disk ● *AA18*
Similar in use to Discovery's *Pyradev*. It loads a profile of inks, printer codes and character set. Word counting, changing disk drives etc – 'housekeeping' tasks – are handily located. Uses extra memory of 128K machines for spooling printed documents and storing text. True file merging is impossible, and control keys are odd. Margins cannot be set further apart than 80 columns, although placing a printer control character at the right hand side allows wider documents to be printed.



Tasword

Tasman Software ● 0532 4388301
464, 464D, 6128 ● £19.95 tape/£24.95 disk ● *AA1*
464 is the tape based version (the same as *Amsword*). 464D has enhancements for a disk drive. 6128 makes full use of a 6128's extra memory. The latter pair include mailmerge facility. Easy to get to know: comprehensive help screens. Screen operations are slow, andtext is reformatted a word at a time.

Wordstar

Micropro/Cumana ☎ 0483 571666 £49.95 disk only (CPM) ● *AA1*
Files can be as big as the space available. A professional program, with huge manual and a layout like mission control. If you want a function, it is in there... somewhere. Not fast.

Manufacturers' recommended retail prices are listed as guidelines, but heavy discounts are offered by retailers.

PRINTERS

Amstrad DMP/2160

Amstrad ☎ 0277 230222
£159.95 ● *AA6*
Load through front: printer must be above paper; but loading continuous stationery is easy. Poor NLQ mode. £5 for ribbons. Low priced, rather than a bargain.

Amstrad DMP3160

Amstrad
£228.85 ● *AA29*
Similar to but faster than DMP2160. Accepts all IBM and Epson printing codes. NLQ is front loading system. Good buy.

Amstrad DMP4000

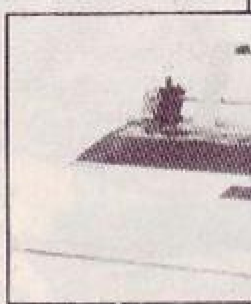
☎ 0277 230222
£401.35 ● *AA20*
A real text cruncher. Wide carriage, and really flies across the paper, up to about 200 cps (in NLQ about 50 cps). Fonts available: standard 9 pin Pica, Elite, condensed etc. – but they are different, rather than just adjusted spacing for the same characters.

Amstrad LQ3500

☎ 0277 230222
£401.35 rrp ● AA31
Cheapest 24-pin printer. Paper loaded from the rear – more time consuming. 30 cps in letter quality mode, and 62 cps in draft. Print quality excellent: plenty of different type-styles built in. Not ultra fast.

Citizen 120D

Citizen ☎ 0800 282692
£159 ● *AA43*



Dimensions: 3.7 kgs, and 370mm x 90mm x 238mm. Draft quality is 'dott,' and poor, but NLQ is sharp and simple. A quiet beast, with cable to the computer connected on the side. Manual includes a complete written breakdown of all the printer control commands, and their effects.

Epson LX800

Epson ☎ 01 902 8892
£320.85 ● AA29
Very fast for 9 pin. Control panel for style selection, and Epson compatible. Reverse winding sheets requires care, though.

Epson EX800

☎ 01 902 8892
£458.85 ● *AA29*
Upgradable in 101 ways – cut sheet feeds, serial ports, longer life ribbons. Quiet, with respectable printing speed. Sans Serif/Roman NLQ fonts incorporated. Control panel to select fonts – just the same font with different spacings.

Epson LQ500

Epson ● £803 rrp ● *AA29*
Features galore and price to match. Handles both Sans Serif and Roman styles of NLQ, for instance. Colour-

printing upgrade kit available. 24 pin printer, offering excellent quality printing. Control panel to select from many available fonts (ie. the same font at different widths).

Mannesmann Tally MT81

Mannesmann Tally ☎ 0734 788711 ● £149 ● *AA43*

Dimensions: 70mm X 100mm X 265mm; weight, 4.5 kgs. Draft quality is 'dott,' and poor, but NLQ is sharp and simple. Prints Epson and IBM graphics. Draft mode print quality is good: square printhead pins put ink onto greater areas. The printed output is more ornate than the Citizen. Manual is superb, but falls down in failing to explain control codes: for that you have to buy the applications manual. Certainly a very good buy.

Panasonic KXP3131U

Panasonic ☎ 0753 73181 ● £335.25 (discont.) ● *AA29*

Daisywheel therefore superb quality – but can't print bit graphics (no trendy screen dumps), and if you want different fonts, you have to plug in a different Diablo-compatible one. Not quiet.

Panasonic KXP1081

Panasonic ● £245 rrp ● AA29

Similar to DMP2000/2160: chunky, 9 pins, 10 inch carriage and compatible with Epson codes. Thorough A4 manual, good NLQ mode – better than DMP – and condensed, draft and NLQ modes.

Star LC10

Star ☎ 01 840 1800 ● £263.35/£297.85 rrp ● AA32

First price is for standard dot matrix printer. Fonts selected by button, rather than typing in fiddly control code. Second price is for relatively inexpensive colour model. Uses multi-colour ribbon to produce different mixes. Plastic paper feeder on both models.



INTEGRATED PACKAGES

Info-Script

Brunning ☎ 0245 252854
£46 disk only ● 128K/256K only ● *AA35*

Billed as the 'complete database with word-processor and spelling checker', it's best with 256K. Well set up, easy to use and allows for changes in layout and content. Manual could be clearer.

Protext Filer/Office

Arnor ☎ 0733 68909
£24.95/£34.95 disk only ● *AA34*

Database that works comfortably with *Protext*, has powerful sorting options and comprehensive invoice printer. Can be slow, but good value.

Arc Education Master Pack

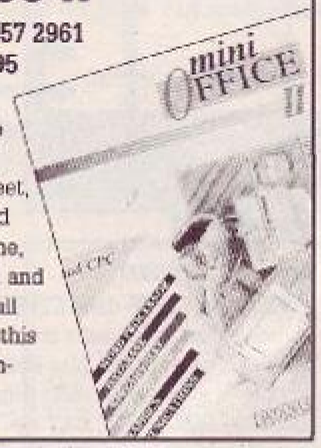
Arc Education ☎ 0472 812226
£48 disk ● *AA32*

A massive pack of 70 programs: Junior; Primary; a parent/child adventure; DR Logo and word games. Each set available at £9 tape and £12 disk. Well presented with good graphics, reasonable musical ditties and plenty of options.

Mini Office II

Database ☎ 051 357 2961
£14.95 tape, £19.95 disk ● *AA6*

Astonishingly cheap word processor, database, spreadsheet, graphics, comms and label printer all-in-one, it's continued to sell, and sell, and sell... Not full specification, but at this price who's complaining?



EDUCATIONAL PROGRAMS

Amstrad Selection

Fernleaf Education ☎ 0474 359037
£12.50 tape, £17.50 disk ● *AA32*

For age range 7 to 12+: seven programs – *Fletcher's Castle, Market Stall, The Perfume Hunter, The Raiders, Ferry Captain, Treasure,* and *Thorn Sea.*

Kosmos

Kosmos ☎ 05255 3942 ● £xx disk ● *AA32*

Answer Back Junior Quiz, which began life on the BBC micro, is just what it sounds like: a 750 question quiz, in which you can choose to answer the question, make a choice from a number of options; or say whether something is true or false. There's also *Factfile 500*, sets of additional questions for the program: arithmetic, spelling, sport and natural history.

Kosmos' other range is a foreign language vocabulary tutor in French, Spanish, German and Italian.

LCL

LCL ☎ 0491 57345

Range of Amstrad educational software. Leave message on answerphone and they won't send you a catalogue. At least, they didn't send me one. Still, I'm sure they do really terrific stuff, whatever it is.

School Software

School Software ☎ 010353 6145399 (Ireland) ● *AA32*

Decent software, though a little too dependent on a fairly rigidly structured 'school syllabus'-type presentation. Still, that may be precisely what appeals to some users.

Wordhang

Bourne Education ☎ 0794 523301
£9.95 cassette; £14.95 ● *AA32*

Just one of Bourne's range of ten programs. Others include *Happy Letters, Numbers* and *Writing* (all Infant); *Timeman One/Two, Animal Vegetable Mineral, World-Wise* and *Map Rally* (all Junior); and the excellent *Chemistry* and *Physics Revision* (Senior).

● *See also* Pendown in 'Word Processing'

BUSINESS/ ACCOUNTS

Protext Office

Arnor ☎ 0733 68909
£34.95 ● CPM+, 6128 only ● *AA34*

Requires *Protext* and *Promerge* to run. Information inputted using *Protext*. Mail merge templates included, and very well implemented invoice printing feature. A genuinely useful business system.

SD Microsystems range

☎ 0462 675106
General Ledger ● £19.95 ● *AA32*
Sales Invoicer Pack ● £14.95 ● *AA26*
Small Traders Pack ● £24.95 ● *AA26*
Stock Control ● £39.95 ● CPM+, 6128 only ● *AA32*

SD Microsystems are to be congratulated for their range and quality of small business systems. Consult original reviews for in-depth explanations of what each does and how it differs from the others.

DATABASES

AtLast Plus

Rational Solutions ☎ 056681 511
£39.95 ● CPM+, 6128 only ● *AA30*

Powerful: developed into user's requirements. Data capacity restricted only by disk size, and splitting fields into smaller elements possible. Printed output impressive. Beefy processing.

Masterfile III

Campbell systems ☎ 0378 77762
£39.95 CPM+ ● *AA30*

With parent/child records – enabling tying together of records, saving space and time. Screen layouts and reports menu selected; not for faint hearts, but good results.

Random Access Database

Minerva Systems ☎ 0392 37756
£29.95 disk only ● reviewed *AA6*

40 or 80 column screen. Good mathematical and string operations. Random disk accessing gives speed and power.

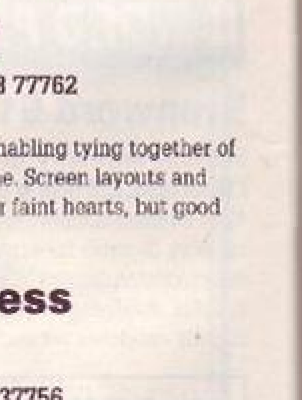
● *See also* Info-Script in 'Integrated Packages'

SPREADSHEETS

Cracker

Newstar Software ☎ 0277 229509
£49.95 disk CPM+ ● *AA9*

Spreadsheets must be created from scratch. Documentation good, command sequences soon learned. Mathematical functions well done, with random numbers catered for. Files limited to 17K – and formulae programming not well implemented.



Mastercalc 128

Campbell Systems ☎ 0378 77762
£33 disk ● 128K machines ● *AA4*
Can show two parts of spreadsheet at once. Includes notepad and calculator. Easy to use, but the mathematical formulae can only consist of the four basic arithmetic options. Slows down as more data is entered.

Matrix

Audiogenic Software ☎ 0734 303663
£34.95 disk ● *AA18*
Uses disk to store data – so good capacity on the plus side, but poor speed on the minus side. Graphic options excellent. Onscreen prompts rare, making it hard at first. Calculating power good.

Supercalc II

Amsoft/Sorcim ☎ 0277 230222
£49.95 CPM+ ● *AA4*
First class documentation. Calculations can be determinative – performed on whether or not cell's contents match given value. Excellent help prompts and arithmetic functions.

SOUND

Amdrum

Cheetah ☎ 0222 555525
£34.95 ● *AA13*
Digital drum machine. Editor comprehensive. Not Midi compatible: to hear output you plug it into amplifier.

DHCP Midi Interface

DHCP ☎ 0440 61207
£69.95 interface, £34.95+ disk s'ware ● *AA33*
DHCP produce Midi software for various Midi interfaces for CPC, which are incompatible with each other.

Micro Music Creator

First Byte Software ☎ 0225 765086
£14.95 disk, £24.95 ROM ● *AA38*
A music composer that lets you put staves and notes onscreen and play tune back. Accents can't be inserted, though. Other side is sampler to capture sounds from tape and play them through CPC. Excellent.

Midi Interface

Silicon Systems ☎ 061 848 8959
£59.95 interface, £59.95 software ● *AA26*
Useless alone, but software you can use with it – DX7, FB01, MT32, D50 and CZ101 – is diverse. Software prices vary, and lack presentation of EMR sequencer. High performance.

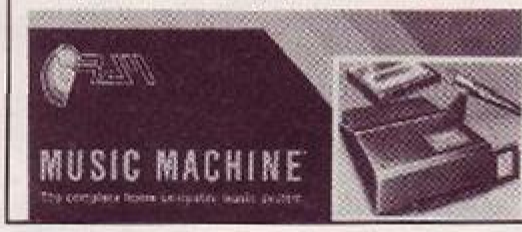


Miditrack Performer

EMR ☎ 0702 335747
£92.50 cass/disk ● *AA13*
Midi interface plus sequencing software to drive Midi equipped instruments. Records each instrument then plays them all at once. Onscreen layout similar to multi-track recorder. Excellent.

Ram Music Machine

RAM Electronics ☎ 0252 850085
£49.95 disk, £59.95 disk ● *AA17*
All in one music package: Midi interface, sound sampler and music editor. Sampler can handle one sample of just over a second. Midi controller software and music editor comprehensive. No through port, though, so 464 users must use tape version. And you can't edit live played Midi compositions.



Sound Blaster

Siren Software ☎ 061 848 8959
£29.99 ● *AA23*
Amplifier and pair of loudspeakers that plug into CPC for maximum 2 watts sound effects.

Speech Synthesizer

DK/RAM Electronics ☎ 0252 850085
£35, £40 ROM
Add-on producing speech by RSX's: loudspeakers supplied. Cannot include speech in program for someone else's CPC, though. Even so, excellent speech quality and value.

VISION

Advanced Art Studio

EEC ☎ 0753 888866
£24.95 disk ● *AA21*
Recently revitalised, this is *the* user-friendly, best and most powerful art package: works in all three modes. Can cycle through inks, and cut and paste different areas, transformations and reflections. Fill routines in coloured patterns. Available as a standard version for £15.95.



AMX Art

Advanced Memory Systems ☎ 0925 413501
£69.95 disk only (includes mouse) ● *AA7*
User friendly, if little unsophisticated compared to *Advanced Art Studio*, but mouse helps greatly. Colour, spraycans, textures, circles and host of other features.

AMX 3D Zicon

Advanced Memory Systems
£39.95 disk only ● *AA24*
Best with mouse, produces wire frame constructions: design in 3D and view from all angles. Slow when calculating heavy maths. Note supplies are scarce, and AMS don't plan more.

Cherry Paint

Siren Software ☎ 061 228 1831
£9.99 disk only ● *AA20*
WIMP controlled – ie mouse moves pointer to various icons to pull-down menus. B/W mode 2 only, but fun. Curves are difficult, but a bargain.

CRL Image System

CRL ☎ 01 533 2918
£14.95 disk/tape ● *AA12*
Boasts range of picture manipulations and distortions, but lacks art options. Best on finished pictures – like a mini Quantel box.

DART Scanner

Dart Electronics ☎ 0502 513707
£79.95 ● *AA22*
Attach reading device to your DMP2000, 3000 or 3160. Feed in picture to printer: device reads in picture as B/W image. Quality onscreen isn't amazing, but it works and it's fun.

Electric Studio Light Pen

Electric Studio ☎ 0462 420222
£19.95 tape, £29.95 disk ● *AA1*
Excellent drawing software, including rubber-banding shapes and lines, filling areas, spray-can etc. Accepts software written for it.



The Informer

Treasure Island Software ☎ 0492 593549
£29 disk only ● *AA33*
For creating animated displays, suitable for classroom and shop window: takes text, graphics and animated displays and produces slide show. Works best but not only with *Parrotry Plus* (see below).

Parrotry Plus

Treasure Island Software ☎ 0492 593549 ●
£19.95 disk only ● *AA30*
Rather than lots of effects used anywhere and at any time, *Parrotry Plus* 'remembers' every alteration and plays through the list to create animation. Note: can't dump pictures to printer without external program.

Vidi Digitizer

Rombo Productions ☎ 0506 39046
£89.95 ● *AA15*
Grabs picture from video recorder or camera and puts it on CPC screen, allowing you to alter it with an package. Easy to use. Software on tape, disk or ROM includes superb printer dump routine. ●

● Corrections, additions or ideas for sections you think should be here are very welcome. Drop a line to: *AA Buyers, Amstrad Action*, 4 Queen St, Bath BA1 1EJ

Don't miss the next *AMSTRAD ACTION*-packed issue – out on *Thursday July 13th!*

AAfterthought



Op. Hormuz comp. winner!

Back in *AA44* we presented you lucky people with a golden opportunity to win an EP CHAMPION electrically powered radio-controlled airplane kit. It was all to celebrate Again Again's *Operation Hormuz*, and we were pretty cheesed off that we weren't allowed to enter, we can tell you!

And what a heap of entries we received! Poor old Trenton pulled the short straw and had to find space for the entries somewhere in his already overcrowded corner of the office. We cheered him up, though, when we allowed him to pick the winning entry...

Congratulations, **DAVID WALFORD of Ambrosden, Bicester in Oxfordshire.** Not only did he get the answers right – as did 99.9% of the entrants (hard luck Bob Crossley) – he was also first out of the *AA* competition entries dustbin. So well done David, and we just hope you have a smart postman who realises the EP CHAMPION isn't going to fit through your letter box!



Nicking muh *AA?* Here, have a knuckle sandwich!

To the newsagent: Amstrad Action is distributed by COMAG

Dear newsagent,

Please reserve me a copy of the August *Amstrad Action*, due out on Thursday 13 July

Name:

Address:

Telephone number:

If you're under 16, please get your parent or guardian to sign here:



The *AA* little filler comp #1

– an occasional section to fill up odd bits of the mag caused by editorial incompetence.

This month £10 goes to the first correct answer to the question, *How many times does the word 'Cecco' appear in this month's AA?* Answers on a postcard/back of an envelope to: *Filler Comp, AA,* 4 Queen St, Bath BA1 1EJ.

ADVERTISERS INDEX

Excellent reasons for subscribing to AA

Now!!

- Make sure you get your issue, the shop may sell out !!
- Get your quarterly update of extra special savings on goodies
- Subscribe to Amstrad Action for £16.50 and you will receive 12 issues plus £20 worth of vouchers

See page 74 for details of our Voucher scheme.

Order Code AA396

T-SHIRT

Just £3.99

The amazing AA T-shirt is here! The sparky red and blue AA logo is printed on a white cotton T-shirt which you can buy for £3.99 in either medium or extra large sizes. Get this and you'll have AA even nearer your heart than ever before!

Order Code
A361 (medium)
A362 (extra large)



HIGHLIGHTER PENS

Three for £1.50

For bringing out those key phrases, there's nothing like these AA-embossed pens in red, yellow and green.

Order Code AA266

AA DUST COVERS

2-piece set only £6.95

A set of dust covers provides a neat solution to dust, tea and other potential computer disasters.

These specially-commissioned Amstrad Action covers are made from high-quality, water (and coffee) proof PVC. They're coloured a gentle beige with smart blue trimming and matching AA logo.

You can order a 2-piece set tailor-made for your CPC system – just choose the correct order code from the list below.

Order Codes

464 mono -	A208	664 colour -	A211
464 colour -	A209	6128 mono -	A212
664 mono -	A210	6128 colour -	A213

AA BINDERS

Just £4.95 each

The fabbo AA binder is the ideal item in which to store your growing collection of the world's most popular CPC magazine! Holds 12 issues, this royal blue binder with gold embossed logo on side and front is an essential purchase for even half-serious readers.

Order Code AA217
(Or buy two for £9.00
Order Code AA2172)

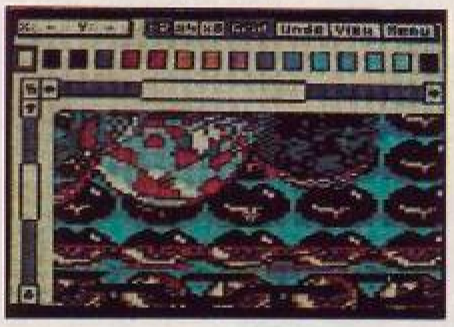
AA Back Issues are just £1.25! or £1.50! See page 74 for details

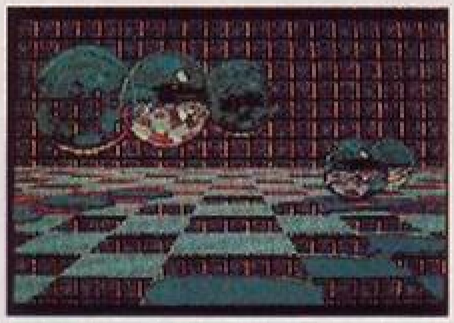
➤ ➤ ➤ ➤ ➤ ➤ ➤ ➤ ➤ See over page for order form

THE ADVANCED OCP ART STUDIO ● From EEC

RRP £24.95 AA Price £19.95

For CPC6128 users (or 464 users with disc drive and 64 rampak)

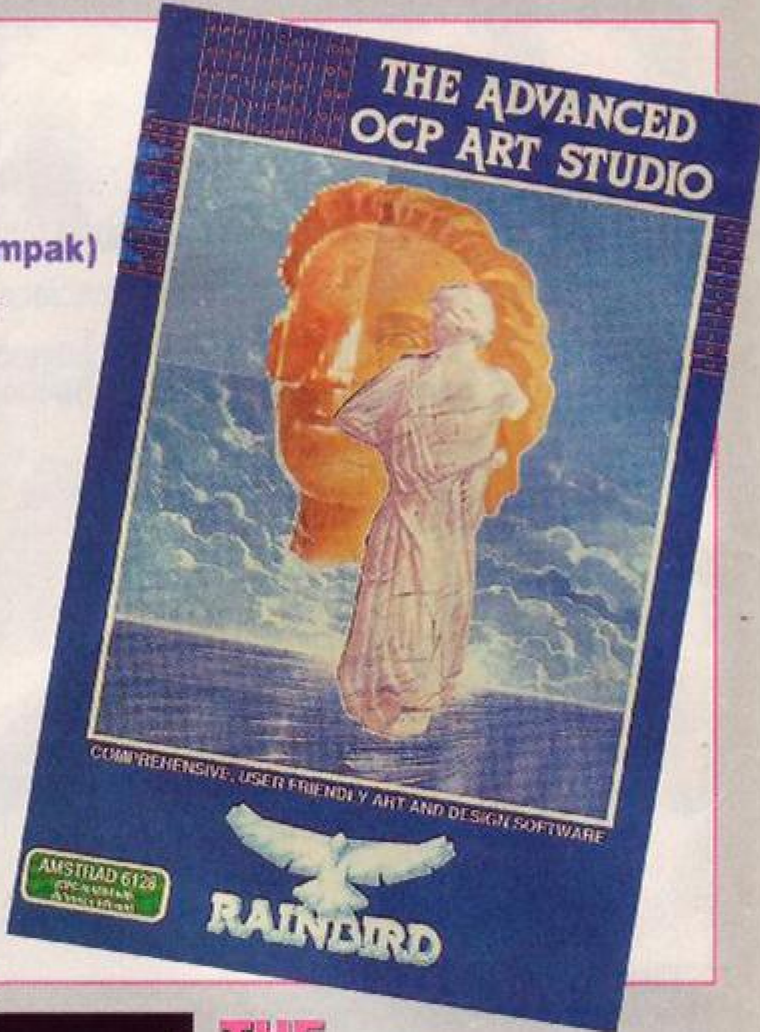




The ultimate in computer art and design for your CPC — no budding artist should be without. Operates from mouse, keyboard or joystick control. Includes 16 drawing pens, 8 random spray cans and 15 user-definable brushes.

- Three levels of magnification with pixel edit, pan and zoom
- Full range of colours
- Windows can be cleared, inverted, cut and pasted, enlarged, reduced, squashed, stretched, flipped and rotated.
- Full-feature font editor allows the design of complete character sets

Order Code AA410



●ORDER FORM No.46

Name

Address

Please remember the post-code, it is essential!

Tel Number (If possible) Date of Order

Please send me the following item(s) from the Amstrad Action Special offer pages:

CODE	DESCRIPTION	PRICE
	Total Payable	

Make cheques & postal orders payable to FUTURE PUBLISHING LTD.If paying by credit card,please enter details

CREDIT CARD NUMBER EXP. DATE

Send this form plus payment to SPECIAL OFFERS, AMSTRAD ACTION, THE OLD BARN, SOMERTON, SOMERSET TA117PY

THE REPLAY "MICRO-BLASTER" JOYSTICK

RRP £12.95 AA PRICE £10.95

The best joystick around for smooth, accurate, arcade quality and comfortable playing action.

- Non slip rubber feet on base for secure table mounted operation.
- Large, dual-fire micro-switched fire buttons for left or right hand operation.
- Extra long 1.4 metre cable allows more choice of player position.
- 12 month guarantee
- Switchable normal/rapid fire options



HOW TO ORDER

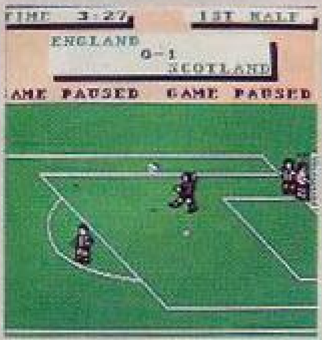
Just fill in the order form above and use the order numbers listed with the product, Or phone us with your credit card details on 0458 74192 (24-hour answerphone).

EMLYN HUGHES INTERNATIONAL SOCCER

• From Audiogenic

AmsCass RRP £9.95 AA Price £6.95 Order Code AA233AC
AmsDis RRP £14.95 AA Price £9.95 Order Code AA233AD

The best soccer game since Matchday II and Football Manager. With diving headers, free-kicks, throw-ons, goalkicks, corners, penalties and even barging: how more realistic can you get?
Enter your teams and set their skills, then manage them through the season.





" Your ain't played Footie on your CPC till you've mastered Emlyn!"
AA June 89

AA CUP WINNER RATING 93%



HOTLINE • PHONE 0458 74011

MINI OFFICE II

• From Database Software

£12.95 tape £17.95 disk
(RRP £14.95/£19.95)

Database's combined word processor, database, spreadsheet, label printer, communications and graphics package and offers the best value for money in any eight-bit integrated package.

Suitable for any CPC (it doesn't run under CP/M), AA called Mini Office 'good enough to fulfil the entire software needs of many a small business!'. That is borne out by the sales figures - more than 400,000 users across the country.

The figures testify to the features. You can build a versatile card index, produce pie charts, access Prestel and other comms networks and run off personalised letters. Altogether, you may never need any other program once you've got Mini Office II. Time to get serious?

Order Code AA388C
Order Code AA388D



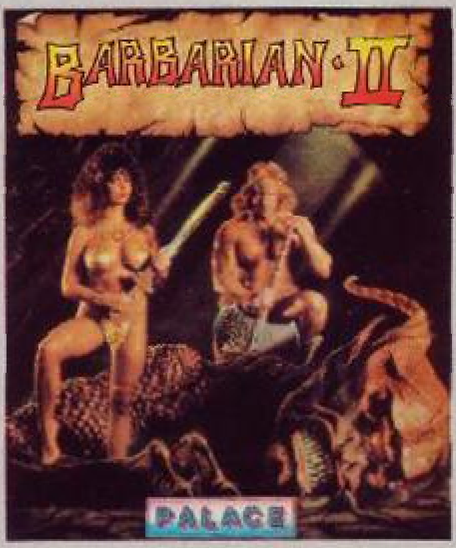
BARBARIAN II

• From Palace Software

The Dungeon of Drax

It is decided that there is only one way to stop Drax from wrecking the Jewelled Kingdom: he must be destroyed!. The Barbarian and Mariana — herself an accomplished swordswoman, are the only two warriors skilled enough to survive the perilous journey to Drax's lair. They must stop him before it's too late!!
Choose to play either Barbarian or Mariana and fight your way through three levels:- the Wastelands, the Caverns and the Dungeons before arriving at the fourth level, the Inner Sanctum of Drax!!
Each level has six different types of monster from Saurian beasts to Giant Grubbs. Collect four magical objects from each level to reach your quest..
Start the game with five lives and fight your way to his sanctum for your final conquest.

Ams Cass RRP £9.95
AA Price £6.95
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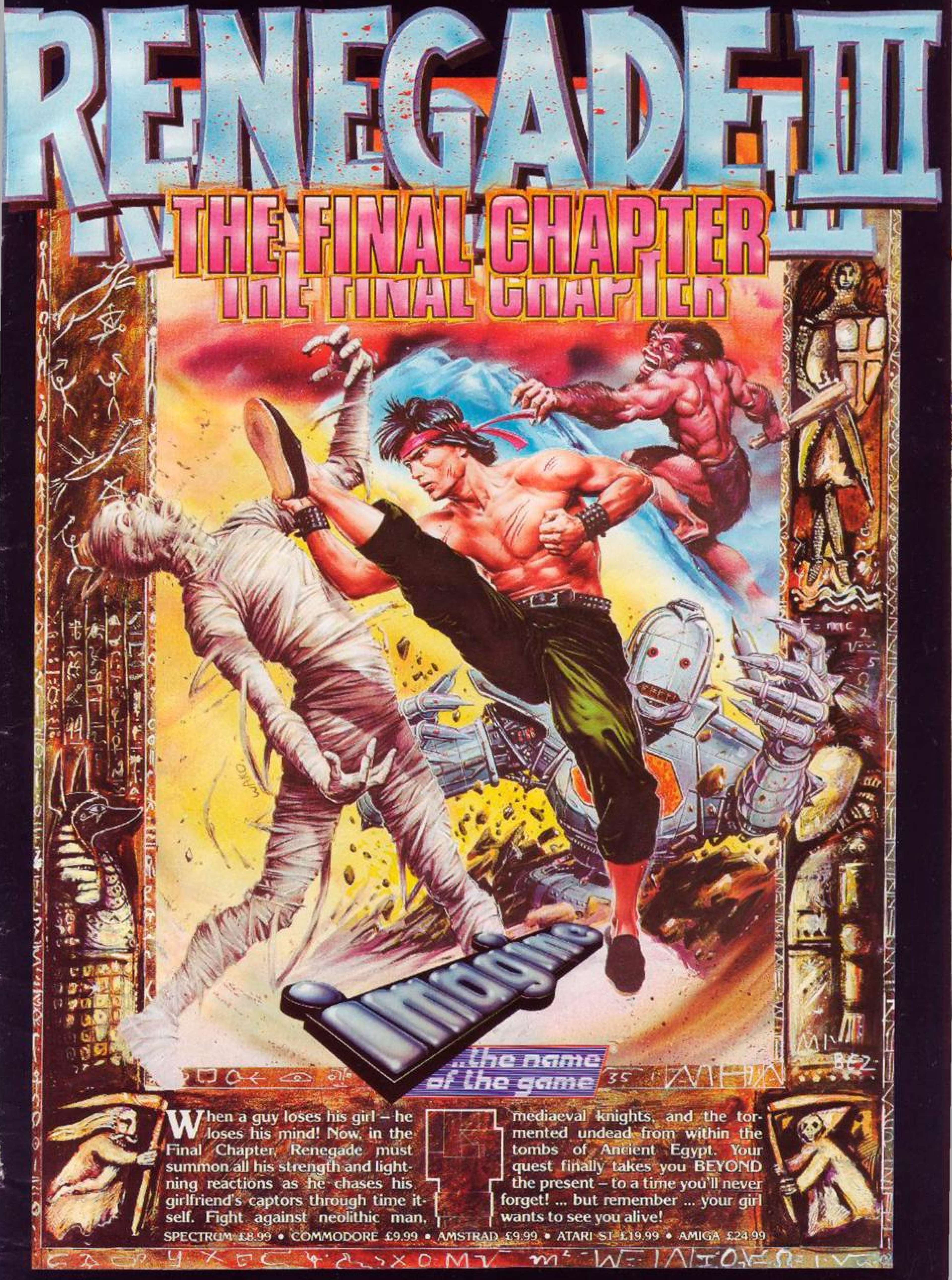
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